

Meteors:

OR,

A plain Description
of all kind of *Meteors*,
as well *Fierſ* and *Ayrie*, as
Watry and *Earthy*:

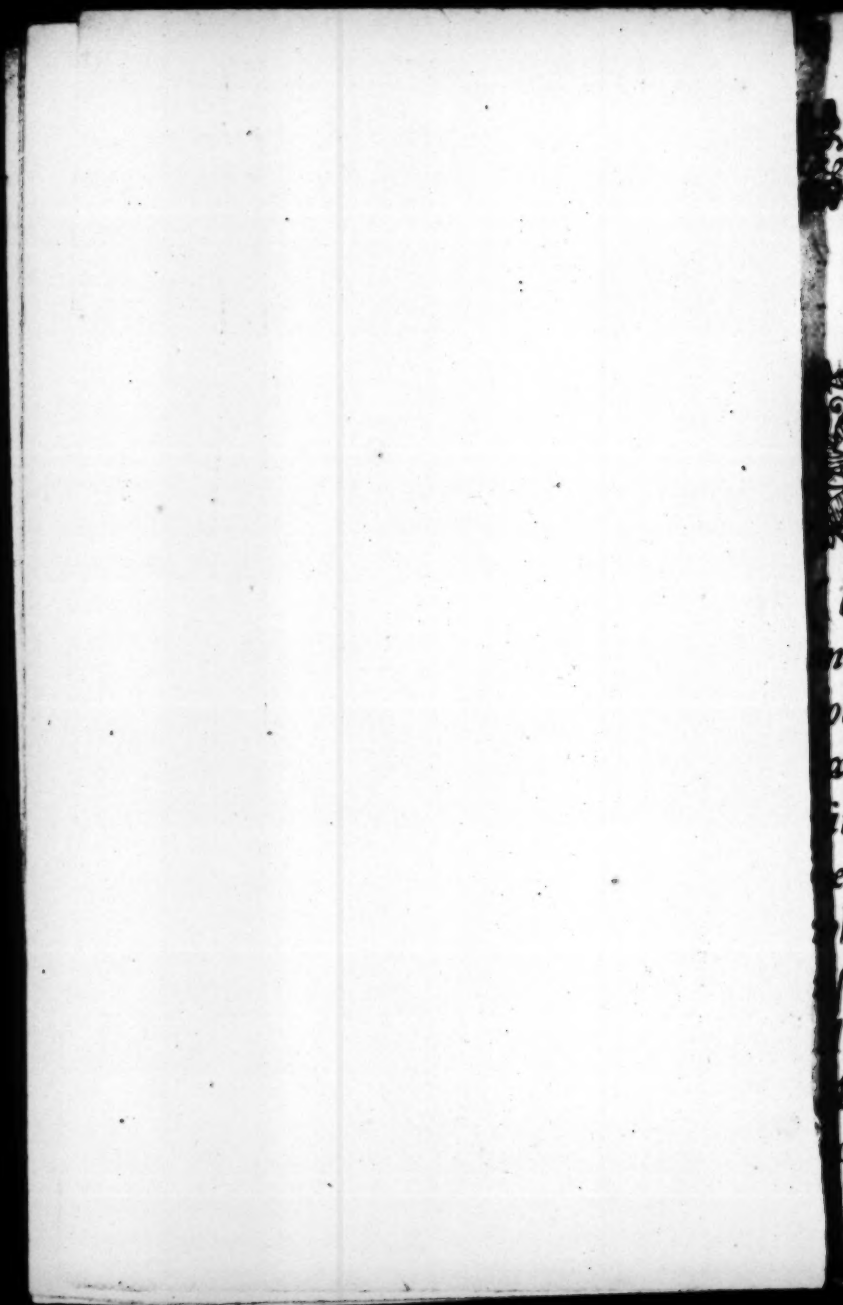
BRIEFLY

Manifesting the *Causes* of
all *Blazing-Stars*, *Shooting-Stars*,
Flames in the Aire, *Thunder*,
Lightning, *Earthquakes*,
Rain, *Dew*, *Snow*, *Clouds*,
Springs, *Stones*, and
Metalls.

By *W. F. Deſtor* in
Divinitic.

L O N D O N,

Printed for *William Leake* at the Crown
in *Fleet-street*, between the two Temple
Gates, 1654.





To the Reader.

I Shall not beg your
pardon for publi-
shing this Book; for
as 'tis none of mine
being written by a famous
and learned Divine) so I doe
not set it forth relying on my
own judgement, but had the o-
pinions and approbation of di-
vers persons of known abilities,
who knew best what is most
usefull for publique Benefit.
And I may (without breach of
modesty) affirm, that there is
not in our Language any Booke
a 2 of

To the Reader.

of so small a bulke, contains
so much of the Doctrine of the
Meteors. We daily behold and
view divers Meteors, but ve-
ry few are skill'd in their Cau-
ses; but those that are not, may
be informed. And I must tell you
also, that this Book on perusall
hath been found so advantagi-
ous, that a person of quality hath
lately taken paines to make di-
vers worthy Observations up-
on it, which here I have sub-
joyned, because you should not
pay for two Books instead of
one. These Observations were
never published till now, and I
trust thou wilt find the Author
did thee a Courtesie. Farewel.

The

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THE FIRST BOOK.

E Or as much as wee intend in this Treatise, to declare the causes of all those bodies that are generated in the earth called *Fossilia*, as well as those other *Impressions* named of their height *Meteors* (which no writer hitherto hath done, that we have seen) the common definition given by the most Writers, in no wise will serve us; and whether we may borrow the name of *Meteoron*, to comprehend the whole subject of our worke, we are not altogether out of doubt; although the Philosopher deriving it from doubtfulness, giveth us some colour so to take it; and peradventure we might be as well excused to apply it to *Minerals*, as other authors are to use it for earthquakes: yet to avoid all occasions of cavilling at words, we shall both define and also describe the subject of our matter on this manner: It is a body compound without life natural: and yet to stop one

A hole

The first Book

Aristot.

hole, because here wanteth the name of the thing to be defined; it is no new thing to them that have read *Aristotle* workes, to find a definition of that whereof there is no name. But what need you be so precise (will some man say)? meane you so to proceed in all your discourse? no verily, but because many of quick iudgement, not considering the stile to bee attempered to the capacitie of the readers, will impute the plainesse to the ignorance of the Author, wee thought good in the beginning to pluck the opinion out of their minds that (as the common saying is) they may know, wee have skill of good manners though we little use them.

The Meteors are divided after three manner of wayes : First, into bodies perfectly and imperfectly mixed : Secondly, into moist impressions and dried parts. Thirdly, into fiery, airy, watry, and earthly. According to this last division we shall speake of them in foure bookes following: but first we must be occupied a little in the generall description of the same, that afterward shall be particularly treated of.

Why

of Meteors.

3

Why they be called imperfectly mixed.

They are called imperfectly mixed, because they are very soon changed into another thing, and resolved into their proper elements of which they do most consist, as do all impressions, etherie, airie, watry: as snow into water, clouds into waters &c.

Why they be called perfectly mixed.

The last sort, namely earthly Meteors, are called perfectly mixed, because they will not easily be changed and resolved from that form which they are in, as be stones, metalls, and other mineralls.

According to the qualitie of the matter, they are divided into moist and drie impressions, consisting either of Vapors or Exhalations. Vapors are called moist, and exhalations drie; which termes must be well noted, because they must be much used.

The first Book

*Of the general causes of all Meteors ;
and first of the material cause.*

The material cause.

THe matter whereof the most part of Meteors doth consist, is either water or earth: for out of the water, proceed vapors, and out of the earth come exhalations.

What be vapors, and what exhalations.

Vapor, as the Philosopher saith, is a certain watry thing, and yet is not water; so Exhalation hath a certain earthly nature in it, but yet it is not earth.

What the middle region is, shall bee told afterward

For the better understanding of Vapors, understand that they be as it were fumes or smokes warme and moist, which will easily bee resolved into water, much like to the breath that proceedeth out of a mans mouth, or out of a pot of water standing on the fire. These vapours are drawn up from the waters and watery places by the heat of the Sun, even unto the middle region of the aire, and there after divers manner of meeting with coldnesse, many kind of moist Meteors are generated, as sometimes clouds and raine, sometime snow and hail; and that such Vapours are so drawn up by the Sunne, it is plaine by experience; for

of Meteors.

5

If there be a plash of water on a smooth and hard stone, standing in the heat of the Sun, it will soon be drie; which is none otherwise but that the Sun draweth up the water in thinne Vapors: for no man is so fond to say, that it can sink into stone or mettall; and it is as great folly to think it is consumed to nothing: for it is a general rule, That that which is once a thing, cannot by changing become nothing: wherefore it followeth, that the water on the stone, is also on the earth, is for the most part drawn up, when the stone or earth is dried.

A generall rule.

Exhalations are as smokes that be hot and dry, which because they be thinne, and lighter then *Vapors*, passe the lowest and middle Region of the aire, and are carryed up even to the highest Region, where for the excessive heat, by nearness of the fire, they are kindled, and cause many kind of impressions. They are also sometimes *viscose*, that is to say, clammy, by reason whereof, they cleaving together and not being dispersed, are after divers sorts set on fire, and appear sometimes like Dragons, sometimes like

What Exhalations be.

A 3

Goats,

Goats, sometimes like candles, sometimes like spears.

By that which is spoken of *Vapours* and *Exhalations*, it is evident, that out of the fire and aire, no matter where *Meteors* should consist, can be drawn because of their subtilty and thinnesse. For all *Exhalation* is by making a grosser body more thinne: but the fire (we mean the elemental fire, and not the fire of the Kitchen chimney) is so subtil and thinne, that it cannot be made thinner likewise the aire is so thinne, that if it be made thinner, it is changed into fire and as the fire, if it were made thicker would become aire; so the aire being made grosser, would be turned into water. Wherefore to conclude this part of the great quantity of matter, that causeth these *Meteors*, is taken out of the earth and the water. As for the aire and the fire, they are mixed with this matter as with all other things, but not so abundantly, that they may be said the material cause of any Meteor, though without them none can be generated.

The efficient cause.

The efficient cause of all *Meteors*, is that cause which maketh them; even as the Cause

pente

center is the efficient cause of an house.
This cause is either first or second.

The first and efficient cause is God
the worker of all wonders, according to
that testimonie of the Psalmist, which
saith, Fire, haile snow, ice, wind and
storme, doe his will and commandment;
he sendeth snow like wooll, &c. Al-
mightie God therefore being the first,
principall and universall cause efficient
of all natural works and effects, is also
the first cause of these effects, whose pro-
fit is great, and operation marvellous.

The second cause efficient, is double,
either remote, that is to say, farre off
or next of all. The farther cause of them
as of all other naturall effects, is the
same; the Sun with the other Planets
and Stars, and the very heaven it self in
which they are moved; But chiefly the
Sunne, by whose heat all or at least wise
the most part of the vapors and Exha-
lations are drawn up.

The next cause efficient as the first
qualities, are heat and cold, which cause
divers effects in Vapors & Exhalations.

But to return to the heat of the Sun,
which is a very neere cause, it is for

The first Book

this purpose two wayes considered.

One way, as it is meane and temperate ; Otherwise, as it is vehement and burning. The meane, is by which he draweth vapors out of the water, and exhalations out of the earth, and not onely draweth them out, but also lifteth them up very high from the earth into the aire, where they are turned into divers kinds of *Meteors*.

The burning heat of the Sunne is, by which he burneth, dissipateth and consumeth the vapors and exhalations before he draweth them up, so that of them no *Meteors* can be generated.

These two heats proceed from the Sun, either in respect of the place, or the time; but most properly according to the casting of his beames either directly or undirectly.

In place where the Sunnes beames strike directly against the earth and the water, the heat is so great, that it burneth up the *Exhalations* and *Vapours*, so that there are no fiery *Meteors*, much lesse watery : as it is in the South parts of the world, under and neere to the Equinoctiall line.

But in places where the beames are
cast

of Meteors.

9

cast indirectly and obliquely, and that where they are not too nigh to the direct beams, nor too far off from them; there is a moderate heat, drawing out great abundance of matter, so that in those Countries, many *Meteors* of many sorts are generated, as in the far North parts are few but watry impressions. Also in *Autumn* and *Spring* are oftner *Meteors* seene, then in Summer and Winter, except it be in such places where the Summer and Winter are of the temper of the *Spring* and *Autumne*. Let this be sufficient for the Efficient causes of impressions, as well first and principall, as second and particular. Concerning the formall and finall cause, we have little to say, because the one is so secret, that it is known of no man: the other so evident, that it is plaine, to all men. The essentiall Form of all substances, Gods wisdom comprehendeth; the universall chiefe and last End of all things. is the glory of God. Middle Ends (if they may be so called) of these impressions are manifold profits to Gods creatures, to make the earth fruitfull, to purge the aire, to
set

set forth his power, to threaten his vengeance, to punish the world, to move to repentance; all which are referred to one end of Gods eternall glory, ever to be praised, Amen.

*Of the places, in which they
are generated.*

THe places in which *Meteors* are caused, be either the aire or the earth: in the air be generated rain, hail, snow, dew, blazing stars, thunder, lightning, &c. In the earth be welles, springs. earthquakes, metals, minerals, &c. made, and as it were, in their mothers belly begotten and fashioned. But for the better understanding hereof, such as have not tasted the principles of *Philosophy*, must consider that there be foure elements, Earth, Water, Aire, and Fire, one compassing another round about, saving that the waters by Gods commandement are gathered into one place, that the land might appear. The highest is the spheare of the Fire, which toucheth the hollownesse of the moons heaven: the next is the aire, which is in the hollownesse of the fire: the aire within his hollownesse

of Meteors.

11

hollownesse comprehendeth the water and the earth, which both make but one spheare or Globe, or as the common sort may understand it, one ball. So each element is within another, as scales of a perch are one above another: or (to ule a grosse similitude) as the peeles of an Onion are one within another: after the same sort from the highest heaven to the earth that is lowest, one part that is greater compasseth round about another that is lesser. But for this present purpose it is to be knowne, that the aire is divided into three regions, the highest the middle and the lowest. The highest because it is next to the region of the fire, is exceeding hot: the lowest being next the earth and waters, is temperate, and by repercussion or striking backe of the Sunne beames waxeth hot, and by absence of them is made cold, being subject to winter and summer. The middle region of the aire, is alwaies exceeding cold, partly because the sunne beames cannot be cast back so high, and partly because the cold that is there, betweene the heat above, and the heat beneath it, is so kept in, that it can not get out, so
that

What the
regions of
the aire be

The first Book

that it must needs be excessively cold: for the water and the earth, being both cold Elements, after the Sunne setting in the night season, doe coole the aire, even to the middle region. But in the morning the Sunne rising warmeth the aire, so farre as his beames which are beaten backe from the earth and the water, can extend and reach; which is not so high as the middle region, and by heat on both sides is inclosed and kept, saving that a little thereof falleth downe in the night, which the next day with much more is driven back againe. Wherefore this region being so cold, is dark and cloudy, in so much that some doting Divines have imagined purgatory to be there in the middle region of the aire. In the highest region be generated Comets or blazing stars and such like of divers sorts. In the middle region clouds, rain, stormes, winds &c. In the lowest region, dew, frost, hoar-frost, mists, bright rods, candles, burning about graves, and gallowfes, where there is store of clammy, fattie or oily substance, also lights and flaming fires seen in fields, &c. And thus much for the general causes of all Meteors.

THE

THE SECOND BOOKE

Of Fiery Meteors.



Fiery impression, is an *Exhalation* set on fire in the highest or lowest region of the aire, or else appearing as though it were set on fire and burning.

They are therefore divided into flames and Apparitions. Flames are they which burn indeed, and are kindled with fire. These are discerned by four ways; by the fashion of them, by their place, by the abundance of their matter, and by the want of their matter. Their placing is after the abundance and scarcity of the matter whereof they consist: for if it be great, heavy and grosse, it cannot be carried so far as the middle region of the ayre, and therefore is set on fire in the lowest region: if it be not so great, light, and full of heat, it passeth the middle region, and ascendeth to the highest, where it is easily kindled and set on fire.

According

The second Book

According to their divers fashions, they have divers names: for they are called burning stubble, torches, dauncing or leaping Goates, shooting or falling starres, or candles, burning beames, round pillars, spears, shields, Globes or bowles, firebrands, lampes, flying Dragons or fire drakes, painted pillars, or broched steeples, or blazing starres, called *Comets*. The time when these impressions doe most appeare, is the night-season: for if they were caused in the day time, they could not be seen, no more then the stars be seen, because the light of the Sunne which is much greater, dimmeth the brightness of them being lesser.

Of the generation of the impression called burning stubble or sparkles of fire.

Sparks of
fire.

THe generation of this *Meteor* is this; when the matter of the *Exhalation* is in all parts alike thin, but not compacted or knit together, then some part of it being caryed up into the highest Region, by the fiery heat is set on fire before another part that cometh up after it, and so being kindled by little and

and little, flieth abroad like sparkles out of a chimney, insomuch that the common people suppose, that an infinite number of stars fall down, whereas it is nothing else but the *Exhalation* that is thin, kindled in many parts, sparkling as when sawdust or cole-dust is cast into the fire.

Of Torches

TOrches or firebrands are thus generated: when the matter of the exhalation is long and not broad, being kindled at one end thereof in the highest region of the aire, it burneth like a torch or firebrand, and so continueth till all the matter be burnt up, and then goeth out; none otherwise then a Torch when all the stuffe is spent, must needs burne no longer.

Of dancing or leaping Goates

Dancing Goates are caused when the exhalation is divided into two parts, as when two torches be seen together, and the flame appeareth to leap or dance from one part to the other, much like as bals of wild fire dance up and down in the water.

Of

Of shooting and falling stars.

**Shooting
Stars.**

A Flying, shooting, or falling star, is when the exhalation being gathered as it were on a round heape, and yet not throughly compacted in the highest part of the lowest region of the ayre, being kindled by the sodaine cold of the middle region, is beaten backe, and so appeareth as though a starre should fall, or slide from place to place. Sometime it is generated after another sort; for there is an exhalation long and narrow, which being kindled at one end burneth swiftly, the fire running from end to end, as when a silk thred is set on fire at the one end. Some say it is not so much set on fire, as that it is direct under some Star in the firmament, and so receiving light of that star, seemeth to our eies to be a Star. Indeed sometimes it may be so; but that it is not so alwayes, nor yet most commonly, it may be easily demonstrated. The Epicureans, as they are very grosse in determining the chiefe goodness: so they are very fond in assigning the cause of this Meteor. For they say, that the stars fall

**The Epicu-
rians
Opinion.**

out

out of the firmament, & that by the fall
of them, both thunder and lightning
are caused: for the lightning (say they)
is nothing else but the shining of that
Starre that falleth, which falling into
a waterie cloud, and being quenched
in it, causeth that great thunder, even
as hot Iron maketh a noise if it be cast
into cold water. But it is evident, that
the starres of the firmament cannot fall, for GOD hath set them fast for
ever; he hath given them a Commande-
ment which they shall not passe. And
though they should fall into the clouds,
yet could they not rest there, but with
their weight being driven down, would
cover the whole earth. Pf. 148

The great-
nes of
Starres

For the least starre that is seen in the
firmament, is greater then all the earth.
Here will step forth some merrie fellow
which of his conscience thinketh them
not to be above three yards about, and
say it is a loud lie; for he can see within
the compasse of a bushell, more then 20
stars. But if his bushell were on fire
20 mile of, I demand how bigge it
would seme unto him? He that hath
any wit will easily perceive, that
B A prooffe
of the
Starres
greatnes

Starres

The Second Book

starres being by all mens confession, so many thousand miles distant from the earth, must needs be very great, that so far off should be seen in any quantity. Thus much for the shooting or falling starres

Burning
candles.

Of burning Candles.

When the *Exhalation* carried up into the highest part of the ayre, is in all parts thereof of equall and like thinness, and also long, but not broad, it is set on fire and blazeth like a candle, until the *Exhalation* be quite consumed.

Burning
Beames
and round
pillars

Of burning Beames and round Pillars.

These are caused, when the *Exhalation* being long and not very broad, is set on fire all at once, and so burneth like a great beame or logge. The difference of Beames and Pillars is this; for beams are when they seeme to lie in length in the ayre, but they are called Pillars, when they stand right up, the one end neerer to the earth then the other

Of Burning Spears.

Burning
Speares.

Burning speares are generated, when a great quantity of exhalations, which

which may be called a dry cloud, is set on fire in the midst, and because the cloud is not so compact, that it should suddenly rend, as when thunder is caused, the fire breaketh out at the edges of the cloud, kindling the thin *Exhalations*, which shoot out in great number like fiery speares; or darts, long and very small; wherefore they continue not long: but when they fayle, within a short while after, more fire breaking out, they shoot as many more in their place: and likewise, when they are gone, others succeed, if the quantity of the matter will suffice, more then a douzen courses. This impression was seene in London, *Anno Dom. 1560.* the thirty day of Ianuary, at eight of the clock at night, the ayre in all other places being very darke; but in the North-east where this cloud burned, it was as light as when the day breaketh toward the Sunne rising, in so much that plaine shadow of things opposite was seene. The edge of this cloud was in the fashion like the Raynebow, but in colour very bright, and oftentimes casting forth almost innumerable darts.

of wonderfull length, like squibs that
are cast into the ayre, saving that they
move more swiftly then any squibs

Of Shields, Globes or Bowles.

Shields,
Globes or
Bowles.

THese *Meteors* also have their
name of their fashion, because they
are broad, and appeare to be round;
otherwise their generation differeth
not from the cause of the like impres-
sions before mentioned.

Of Lampes.

Lampes.

THe Lampe consisteth of an *Exha-*
lation that is broad and thick, but
not equally extended; namely, smaller
at one end then at another, which being
kindled about the middest thereof,
burneth like a lampe. The cause why,
as well this impression, as many other,
appeareth round, is not for that alwaies
they are round indeed, but because the
great distance causeth them to seem so.
For even the square formes far off seem
to be round. It is written, that a Lamp
fell down at Rome, when *Germanicus*
Cesar set forth the sight of sword play-
ers.

Flying
Dragons,
or fire
Drakes.

Of flying Dragons or fire Drakes.

Flying Dragons, or as Englishmen
call

call them, fire-Drakes, be caused on this manner. When a certaine quantity of vapors are gathered together on a heap, being very neere compact, and as it were inward tempered together, this lump of vapors ascending to the region of cold, is forcibly beaten back; which violence of moving is sufficient to kindle it; although some men will have it to be caused between 2 clouds, a hot and a cold; then the highest part, which was climbing upward, being by reason more subtil and thin, appeareth as the Dragons neck, smoking, for that is was greatly in the repulse bowed or made crooked, to represent the Dragons belly. The last part by the same repulse turned upward, maketh the tayle, appearing smaller for that it is both further off, and also for that the cold bindeth it. This dragon thus being caused, flyeth long in the ayre, and sometime turneth to and fro, if it meet with a cold cloud to beat it back, to the great terrour of them that behold it: of whom some call it a fire Drake: some say it is the Devill himselfe, and so make report to others. More then 47 yeeres agoe,

The second Book

on May day, when many young folk went abroad early in the morning, I remember by six of the clocke in the forenoone, there was newes come to London, that the Devill, the same morning, was seen flying over the Thames: afterward came word, that he lighted at Stratford, and there was taken and set in the Stockes, and that though he would fane have dissembled the matter by turning him selfe into the likenesse of a man, yet was he known well enough by his cloven foot. I knew some then living, that went to see him, and returning, affirmed, that he was seene flying in the ayre, but was not taken prisoner. I remember also, that some wished he had been shot at with Gunnes or shafts, as he flew over the Thames. Thus do ignorant men iudge of these things that they know not. As for this Devill, I suppose, it was a flying Dragon, whereof we speake, very fearefull to looke upon, as though he had life, because he moveth, whereas it is nothing else but clouds and smoake: so mighty is God, that he can feare his enemies with these and such like operations.

tations, whereof some examples may
be found in holy Scripture.

*Of the Pyramidall Pillar like a spire or
broached Steeple*

THis sharpe poynted pillar, is gene- Of Spires
rated in the highest region of the
ayre, and after this sort: When the
Exhalation hath much earthly matter
in it, the lighter parts and thinner (as
their nature is) ascending upward, the
grosser, heavier, and thicker, abide to-
gether in the bottome, and so is it of
fashion great beneath, and small poynt-
ed above, and beeing set on fire it is so
seene, and thereof hath his name.

Of fire scattered in the ayre.

Fire scattered in the ayre, or illu- Fire scat-
minations, are generated in the tered.
lowest region of the ayre, when very
drie and hot *Exhalations* are drawne
up, and meeting with cold clouds,
are sent back againe, which motions
doe set them a fire; whose parts being
not equally thick or ioyned together,
seeme as though fire were scatterd in
the ayre: Yea sometimes, the whole ayre
seemeth to burne, as though it would
rayne fire from Heaven, and so it hath

B+

come

The second Book

come to passe, burning both Cities and Townes. Then iudge how easy it was for God to raine fire upon Sodom and Gomorra, for their sins and wickedness.

Of lights that goe before men, and follow them abroad in the fields, by the night seaser.

Light that goeth before men, & followeth them in the night

THere is also a kind of light that is seen in the night season, & seemeth to goe before men, or to follow them, leading them out of their way into waters, and other dangerous places. It is also very often seene in the night, of them that saile on the Sea, and sometime will cleave to the mast of the Shippe, or other high parts, sometime slide round about the Shippe, and either rest in one part till it goe out, or else be quenched in the water. This impression seene on the land, is called in Latine *Ignis fatuus*, foolish fire, that hurteth not, but onely feareth fookes. That which is seene on the Sea, if it be but one, is named *Helena*; if it be two, it is called *Castor and Pollux*.

The foolish fire is an *Exhalation* kindled by meanes of violent moving, when by cold of the night, in the lowest region of the ayre, it is beaten downe; and

and then commonly, if it be light, seek-
 th to ascend upward, and is sent down
 gaine; so it danceth up and downe.
 Ife if it move not up and downe, it is
 a great lumpe of glewifh or oyle matter
 that by moving of the heat in it selfe, is
 inflamed of it selfe, as moyft hay will
 be indled of it selfe. In hot and fennie
 Countries, these lights are often seene,
 and where is abundance of such un-
 ctuous and fat matter, as about Church-
 yards, where through the corruption
 of the bodies there buried, the earth is
 full of such substance : wherefore in
 Church-yards, or places of common
 buriall, oftentimes are such lights seene,
 which ignorant and superstitious fooles
 have thought to be soules tormented in
 the fire of Purgatory. Indeed the Devill
 hath used these lights (although they
 be naturally caused) as strong delusions
 to captive the minds of men with feare
 of the Popes Purgatory, whereby he
 did open injury to the blood of Christ,
 which onely purgeth us from all our
 sins, and delivereth us from all torments
 both temporall and eternall, according
 to the saying of the wise-man, The
 soules

The second Book

Soules of the righteous are in the Hand
 of God, and no torment toucheth them.
 But to returne to the lights, in which
 there are yet two things to be conside-
 red. First, why they lead men out of
 their way. And secondly, why they
 seeme to follow men and goe before
 them. The cause why they lead men
 out of the way, is, that men, while
 they take heed to such lights, and are
 also sore afraid, they forget their way, &
 then being once but a little out of their
 way, they wander they wot not whi-
 ther, to waters, pits and other very
 dangerous places. Which, when at
 length they hap the way home, will tell
 a great tale, how they have beene led
 about by a spirit in the likenesse of
 Fire. Now the cause why they seeme
 to goe before men, or to follow them,
 some men have said to be the moving
 of the ayre, by the going of the man,
 which ayre moved, should drive them
 forward if they were before, and draw
 them after if they were behind. But
 this is no reason at all that the Fire,
 which is oftentimes three or foure miles
 distant from the man that walketh,
 should

should be moved to and fro by that
ayre which is moved through his wal-
king, but rather the moving of the ayre
and the mans eyes, causeth the fire to
seeme as though it moved, as the Moone
to children seemeth, if they are before
it, to run after them : if she be before
them, to run before them, that they
cannot overtake her, though she seeme
to be very neere them. Wherefore these
lights rather seeme to move, then
that they be moved indeed.

Of Helena, Castor and Pollux

When the like substance in the
lowest region of the ayr, over
the Sea, by the like occasion is set on
fire, if be one only, it is called *Helena*;
if their be two, they are called *Castor*,
and *Pollux*. These impressions will often-
times cleave to the mast, and other parts
of Ships, by reason of the claminesse
and fatnesse of matter. *Helena* was of
the Heathen men taken as a Goddesse,
the daughter of *Jupiter* and *Leda*. *Castor*
and *Pollux* were her brethren. *He-
lena* was the occasion that *Troy*
was destroyed; therefore the Mariners
by experience trying, that one
flame

*Helena,
Castor,
Pollux.*

The second Book

flame of fire appearing along, signified
 tempest at hand, supposed the same flame
 to be the goddesse *Helena*, of whom
 they look'd for nothing but destruction.
 But when two lights are seen together,
 they are a token of fair weather, and
 good luck : the Mariners therefore be-
 lieved that they were *Castor* and *Pollux*,
 which sayling to seek their sister *Helena*
 being carried to Troy by *Paris*, were
 never seen after and thought to be tran-
 slated into the number of the Gods
 that gave good successe to them that
 sayl, as we read in the last Chapter of
 the Acts of the Apostles, that the Ship
 wherein *S. Paul* sayled, had a badge
 of *Castor* and *Pollux*. A naturall cause
 why they may thus foreshew either
 tempest or calmnesse, is this; One flame
 alone may give warning of a tempest,
 because that as the matter thereof is
 compact, and not dissolved; so it is
 like, that the matter of the tempest
 (which never wanteth) as wind and
 clouds, is still together, and not dis-
 sipated, then is it like not long after
 to arise. By two flames together may
 be gathered, that as this *Exhalation*
 which is very thick, is divided : so
 the

the thick matter of tempests is dissolved
and scattered abroad by the same cause
that this is divided. Therefore not
without a reason, the Mariner to his
mates may promise a prosperous course.

*Of flames that appeare upon the haire
of men or beasts.*

Flames
upon
haire of
men and
beasts.

There is another kind of fiery im-
pression, which is flames of fire
upon the haire of men and beasts,
especially horses. These are sometime
clammy *Exhalations*, scattered abroad
in the air, in small parts, which in the
night, by resistance of the cold, are
kindled, cleaving on horses eares,
on mens heads and shoulders that
ride or walke. In that they cleave upon
haire, it is by the same reason that
the dew will be seen also upon haire
or garments, whose wooll is high,
as frize mantels and such like. Another
sort of these flames are caused, when
mens or beasts bodies being chafed, send
forth a fat and clammy sweat, which
is in like manner kindled as the sparks
of fire that are seene when a black horse
is curried. *Livius* reporteth of *Servius*
Tullius, that as he lay asleep, being a
child,

Livius.
Servius
Tullius.

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Marius.

child, his hair seemed to be ail on a flame, which for all that did not burn his hair or hurt him. The like history he reciteth of one *Marius* a Knight of *Rome*, that as he made an Oration to his Soldiers in *Spain*, they saw his head burning on a light fire, and himself not ware of it. Thus much concerning these Flames.

Of Comets or Blazing Stars.

Comets or
blazing
Starres,

A Comet is an exhalation hot and dry, of great quantity, fat and clammy, hard-compact like a great lump of pitch, which by the heat of the Sun is drawn out of the Earth into the highest region of the Air, and there by the excellive heat of the place is set on fire, appearing like a star with a blazing tayl; and sometime is moved after the motion of the Air which is circular, but it never goeth down out of the compass of sight, though it be not seene in the day-time for the brightness of the Sun, but still burneth until all the matter be consumed. An argument of the greatness is this, that there was never any Co-

et yet perceived but at the least it endured 7 days; but much longer they have been seen; namely forty days long, or a fourscore days; and some, six months together. Wherefore it must needs be a wonderfull deal of matter that can give so much nourishment for so great and fervent fire, and for so long time.

There are considered in a *Comet* specially the Colour and Fashion, which both arise of the disposition of the matter.

Their Colours be either white, ruddy, or blew. If the matter be thin, the colour is white; if it be meanly thick, then is the *Comet* ruddy, after the colour of our fire; but when the matter is very thick, it is blew, like the burning of brimstone. And as the matter is more or less after this disposition, so is the *Comet* of colour more or less like to these three principal colours: some yellowish, some dusky, some greenish, some watchet, &c.

In Fashion are noted three differences; for either they seem to be round, with beams round about, or with a beard

The second Book

beard hanging downward, or else with a tayl stretched out sidelong in length. The first fashion is when the matter is thickest in the midst, and thin round about the edges; the second is when the Exhalation is upward thick; and in length downward also meanly thick; the third form is like the second, saving that the tayl hangeth not down but lyeth aside and is commonly longer than the beard.

The temper of the four quarters.

The time of their generation is oftenest in Autumn or Harvest: for in the Spring there is too much moisture, and too little heat to gather a Comet; in Summer is too much heat which will disperse and consume the matter that it cannot be joined together; as for Winter, it is clean contrary to the nature of a Comet which is hot and dry. Winter being cold and moyst: therefore no time so meet as Autumn.

Now for so much as many Learned men have gone about to declare the signification of Blazing stars, we will omit nothing that hath any shadow of Reason, but declare what is written of them.

The signification of Comets.

Such

Such things as are set forth of the be-
okening of Comets are of two sorts :
The first is of natural ; The second of
Civil or Politick Effects.

They are said to betoken Drought,
Barrenness of the Earth and Pestilence.

Drought, because a Comet cannot
be generated without great heat ; and
much moysture is consumed in the bur-
ning of it.

Barrenness, because the fatness of the
Earth is drawn up whereof the Comet
consisteth.

Pestilence, for so much as this kinde
of Exhalation corrupteth the Air,
which infecteth the bodies of men and
beasts.

The Second sort might well be o-
mitted, saving that *Aristotle* himself Aristot.
disdaineth not to seek out Causes for
some of them.

Generally it is noted of all Histori-
ographers, that after the appearing of
Comets most commonly follow great
and notable Calamities. Beside this,
they betoken (say some) Wars, Se-
ditions, Changes of Commonwealths,
and the Death of Princes and Noble
men.

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For what time Comets do shine there be many hot and dry Exhalations in the Ayr, which in dry me kindle heat whereby they are provoked to Anger: of Anger commeth brawling: of brawling, fighting and war of war, victory: of victory, changing of Commonwealths: then also Princes living more delicately then other men are more subject to infection; and therefore dye sooner then other men. it were lawfull to reason of this sort we might enduce them to betoken not only these few things, but all other things that chance in the world.

Yet these predictions have a shew of Reason, though it be nothing necessary; but it is a wonder to see how the Astrologians dore in such devices; they are not ashamed to an earthly substance to ascribe an heavenly influence and in order of judgment to use them as very stars. Surely, by as good reason as to the Celestial stars they attribute Divine influences and effects. But this their folly hath been sufficiently detected by divers godly and learned men, and this place required

no long discourse thereof. Wherefore this shall suffice, both for the natural Causes of Blazing stars, and also for all Flames in general. It followeth therefore that with like brevity we declare the Causes of Fiery Apparitions.

Of Apparitions.

AN Apparition is an Exhalation ^{Apparitions.} in the lowest or highest Region of the Air, not verily burning, but by reflection of light either of the Sun or of the Moon seemeth as though it burned: which appearance of colour riseth not of the mixtion of the four qualities, as it doth in bodies perfectly mixed, as Herbs, Stones, &c. but only the falling of light upon shadow: the light instead of white, and the shadow of darkness instead of black. These diversly mixed according to the divers dispositions of the Exhalation, which ministreth variety by thickness or thinness, cause divers Colours.

There be commonly recited three kinds of Fiery Apparitions; Colours;

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Wide-gapings, and Deep holes which appear in the Clouds.

Of Colours.

Colours in
the Aire.

Colours are here meant when there is nothing else to be noted but the Colours of the clouds: and they are caused (as it is said) by casting the light into the shadowy Cloud, according to it exceedeth more or less in thickness whereof some be very bright-white and that is when the Exhalation is very thin; some yellowish, when the Exhalation is thicker; some ruddy, when it is meanly thick; and very black when it is very thick. The red and ruddy Colours are seen in the morning and evening, when the light of the Sun is not in his full force: for at other times of the day his light is too vehement, clear, strong and piercing. Thus much of Colours.

Of Wide-gaping.

Wide gaping
of
clouds in
the Aire.

Wide-gaping is caused when an Exhalation is thick in the midst, and thin on the edges, then the light being received into it, causeth it to appear as though the sky did rend, and fire break out of it.


Of round opening Hiatus.

These holes called *Hiatus*, differ Round o-
 theom Wide-gapings in nothing but pening in
 e Cat they be less, and therefore seem the Aire.
 can though they were deep pits or holes,
 light not rending or gaping; And these
 ng those Apparitions that appear Fiery,
 need yet be not so indeed. Therefore let
 nites be sufficient to have shewed the na-
 veral Causes of all Fiery Meteors.



THE THIRD BOOK.

Of Airy Impressions.

 Nder the name of Airy
 Impressions, be compre-
 hended such Meteors,
 whose matter is most of
 the Air. Of this sort be
 nds, Earthquakes, Thunder, Light-
 ags, Storme. Winds, Whirlwinds,
 arcles, Rainbowes, The White
 cle, called of some WATLING

street, many Suns, many Moon

Of Winds.

Winds.

THe Wind is an Exhalation hot and dry, drawn up into the Air by the power of the Sun, and by reason of the weight thereof being driven down, is laterally or sidelong carried about the Earth. And this Definition is not to be understood of general Winds that blow over all the Earth or else some great Regions; but besides these there be particular Winds which are known but only in some Countries, and them not very large. These Winds oftentimes have another manner of generation, and that is in this manner;

The second kind of winds.

It must needs be confessed, that within the globe of the Earth be wonderful great holes, caves or dungeons, which when Air aboundeth (as may by divers Causes) this Air cannot abide to be penned in, finds a little hole in or about those Countries as it were a mouth to break out of, and by this meanes bloweth vehemently.

gently : yet that force and vehemency
 extendeth not far ; but as the wind
 that commeth forth of bellows , neer
 the comming forth is strong , but far
 off is not perceived : so this Particular
 Wind , in that particular Country
 where it breaketh forth , is very violent
 and strong , in so much that it over-
 throweth both trees and houses , yet in
 other Countries not very far distant , no
 part of that boysterous blast is felt.
 Wherefore this Wind differeth from the
 general Winds both in Qualities and
 Substance or Matter : for the Matter
 of them is an Exhalation , and the
 Qualities such as the nature of the Ex-
 halation is , very Airy , but not Air in-
 deed : but of this particular Wind the
 Matter and Substance is most com-
 monly Air.

There is yet a third kinde of Wind, The
 which is but a soft, gentle and cool kind of
 moving of the Air, and commeth Wind
 from no certain place (as the gene-
 ral Wind doth) yea it is felt in the sha-
 dow under trees , when in the hot light
 and shining of the Sun it is not per-
 ceived. It commeth whisking sudden-

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ly, very pleasant in the heat of Summer, and ceaseth by and by; the properly is no Wind, but a moving of the Air by some occasion.

As for the general Winds, they blow out of divers Quarters of the Air now East, now West, now South, now North, or else inclining to one of the same Quarters: Among which the East-wind following the nature of the Fire is hot and dry; the South wind expressing the quality of the Air, is hot and moyst; the Western blast agreeing with the Waters property, is cold and moyst; the North that never was warmed with the heat of the Sun being cold and dry partaketh the condition of the Earth. The middle Winds have middle and mixed qualities, after the nature of those Four principall Winds, more or less, as they incline toward them more or less.

The qualities of the winds and the four quarters of the world.

The quality of middle wind.

The profit of wind.

Generally the profit of all Winds, by the wonderfull wisdom of the Eternal God, is very great unto his Creatures. For besides that these Winds alter the Weather. some of them bringing rain, some driness, some frost and snow, and which

Sum which all are necessary ; there is yet
 the universal Commodity that riseth
 moving the only moving of the Air, which
 ere it not continually stirred as it is,
 would soon putrify, and being putri-
 not would be a deadly infection
 now all that hath breath upon the Earth.
 e therefore this wind whose sound we Joh. 3.
 hear, and know not from whence it
 cometh nor whither it goeth (for
 who can affirm from whence it was rais-
 ed, or where it is laid down?) as
 at all other Creatures beside, does teach
 us, is the wonderfull and wise providence
 even of God, that we may worthily cry out Psal. 104.
 Sum with the Psalmist and say, *O Lord, how*
manifold are thy works ! in wisdom hast
thou made them all &c. Let this be suffi-
 cient to have shewed the generation of
 the Winds.

Of Earthquakes,

AN Earthquake, is a shaking of the Earth-
 Earth-
 quakes.
 Earth which is caused by meanes
 of wind and *Exhalations*, that be enclo-
 sed within the caves of the Earth, and
 can find no passage to break forth, or
 else

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else so narrow a way that it cannot soon enough be delivered.

Wherefore, with great force and violence it breaketh out : and one while shaketh the Earth, another while rendeth and cleaveth the same : sometime it casteth up the Earth a great hight into the Air, and sometime it causeth the same to sink a great depth down, swallowing both Cities and Townes, yea and also mighty great Mountaines, leaving in the place where they stood, nothing but great holes of an unknown depth, or else great lakes of Waters.

Of divers kinds of Earthquakes.

Divers
kinds of
Earth-
quakes.

DIvers Authors write diversly of the kinds of Earthquakes, some making more and some less, but we shall be content at this time to comprehend them in four sorts.

The first kind is when the Earth is shaken laterally, to one side, which is when the whole force of the wind driveth to one place, and there is no other contrary motion to let it. This wind, if it be not great, shaketh the Earth,

Earth, that it trembleth as a man that hath a fit of an ague, and doth no more harme: but if it be great and violent, it looseth the foundations of all buildings, be they never so strong, and overthroweth whole Cities, but especially the great buildings, and not only such buildings, but sometimes also casteth down great Hilles, that cover and overwhelm all the valleys under them. Many noble and great Cities have been overthrown by this kind of Earthquake. It is written, that twelve of the most beautifull Cities, and most sumptuous buildings in all *Asia*, were overthrown and utterly destroyed with an Earthquake. How often *Antiochia*, yea within short time was destroyed, they which have read the Histories, can testifie.

Twelve Cities overthrew with one Earthquake.

How terrible was the Earthquake that shook *Constantinople* a whole year together, that the Emperour and all the people, were faine to dwell abroad in the fields under tents and pavilions, for fear their houses would fall on their heads, it is recorded in the Chronicles, and worthy to be remembred.

Constantinople the chiefest City of Greece, now the Turks Palace.

The second kind is, when the Earth with

The second kind.

with great violence is lifted up, so that the buildings are like to fall, and by and by sinketh down again : this is, when all the force of the winds striveth to get upward, after the nature of gunpowder, and finding some way to be delivered out of bondage, the Earth that was hoisted up, returneth to his old place.

The third kind.

Earthquake on the Sea.

The third kind is a gaping, rending, or cleaving of the Earth, when the Earth sinketh down, and swalloweth up Cities, and Townes, with Castles, and Towers, Hills and Rocks, Rivers, and Floods, so that they be never seen again.

Yea the Sea in some places hath been drunk up, so that men might have gone over on foot, untill the time of tide or flood returning covered the place with Waters again. But in the land, where this Earthquake swalloweth up any City, or Country, there appeareth nothing in the place thereof, but a marvelous wide and deep gulfe, or hole. *Aristotle* maketh mention of divers places, and regions that were overthrown with this kind of Earthquake.

Aristot.

The

The fourth kind, is when great The fourth
mountaines are cast up out of the Earth, kind.
or else when some part of the land
sinketh down, and in stead thereof arise
Rivers, Lakes, or Fires breaking out
with smoake and Ashes. It causeth also
overflowings of the Sea, when the Sea
bottome is lifted up, and by this means
arise many Islands in the Sea, that ne-
ver were seen before. These and other
such miracles, are often found in the
Writers of Historics, also in the *Philo-*
sophers, as *Aristotle*, *Seneca*, and *Plinius*.

Nevertheless, the effects of some as
most notable, it shall not be unprofita-
ble to recite. *Plato* in his *Dialogue* inti-
tuled *Timeus*, maketh mention by the
way of a wonderfull Earthquake,
whereby not only *Africa* was rent asun-
der from *Europe* and *Asia* (as it is in-
deed at this day, except a little neck by
the *Mare Mediterraneum*) the Sea entring between
them that now is called *Mare Mediter-*
raneum : but also a wonderfull great
Island, which he affirmeth, was greater
then *Africa* and *Asia* both, called
Atlantis, was swallowed up, and co-
vered by the Waters, in so much, that
on

New
Islands in
the Sea:

Aristot.
Seneca.
Plinius.

Plato.

A wonder-
full Earth-
quake.

Africa, *Eu-*
rope, *Asia*,
the three
parts of the
earth *Ma-*
remediterraneum, be-
cause it go-
eth thorow
the midst
of the
earth.

Atlantis an
Island.

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on the Sea called *Atlanticum*, for a great while after, no Ship could say by reason that the same huge Sea, by resolution of the Earth of that mighty Iland, was all turned into mudde.

The famous Ile of *Sicilia* was also sometime a part of *Italy*, and by Earthquake rent asunder from it. *Seneca* maketh mention of two Ilands, *Theron* and *Therea*, that in his time first appeared. It should seeme both by *Aristotle* and also by *Herodotus*, that *Egypt*, in ancient time, was a gulph of the Sea and by Earthquake made a drie land. During the reigne of *Tiberius* the Emperor, twelve notable Cities of *Aj* were overthrown in one night, &c.

Seneca.
Theron &
Therea.
Arist. Herodotus.
Egypt
sometime
a gulph of
the Sea.

How so great Winds come to be
under the Earth.

THe great Caves and Dennes of the Earth, must needs be full of Ay continually: but when by the heat of the Sunne, the moysture of the Earth is resolved, many *Exhalations* are generated as well within the Earth as without; and whereas the places were full

before so that they could receive no more, except part of that which was in them, were let out, in such countries where the Earth hath few pores, or else where they are stopped with moisture, it must needs follow, that these *Exhalations* striving to get out, must needs rend the Earth in some place, or lift it up, so that either they may have free passage, or else room enough to abide in.

Of signes and tokens that go before an Earthquake most commonly.

THe first, is the raging of the Sea, The signes of an earthquake.
when there are no tempestuous Winds to stirre it, yea, when the Ayr is most calme without Wind.

The caus why the Sea then rageth, is, that the wind beginneth to labour for passage that way, and finding none, is sent back, and soon after shaketh the land.

The second signe is calmness of the Ayr, and cold, which commeth to pass by reason that the *Exhalation* that should be abroad, is within the Earth.

The third signe, is said to be a long thinne

thinne strake of cloud seen, when the skie is clear, after the setting of the Sun. This (say they) is caused, by reason that the *Exhalation* or Vapor, which is the matter of clouds, is gone into the Earth.

Others affirm, that it is the *Exhalation* that breaketh out of some narrow hole of the Earth, out of which the rest of the wind cannot issue, neither will it waite the time: wherefore within while after, it seeketh and maketh itself by sudden eruption a broader way to be delivered out of prison.

Also the Sunne, certaine daies before it appeareth dimme, because the Winds that should have purged and dissolved the grosse Ayr, that caused this dimness to our eyes, is enclosed within the bowels of the Earth.

The Water in the bottome of deep wells is troubled, and the savour thereof infected, because the pestilent *Exhalations* that have been long inclosed within the Earth, doe then beginne a little to be sent abroad. For thereof cometh it, that in many places where Earthquakes have been, great abundance

the abundance of smoak, flame, and ashes is cast
out, when the abundance of brimstone
that is under the ground, through vio-
lent motion is set on fire and breaketh
forth. Finally, who knoweth not,
that stinking Minerals and other
poisonous stuff doe grow under the
earth? wherefore it is no wonder, if
Well-water, before an Earthquake, be
infected: but rather it is to be marvel-
led, if after an Earthquake there fol-
low not a grievous Pestilence, when
the whole mass of infection is blown a-
broad.

Last of all, there is heard before it
the time of it, and after it, a great
noise and sound under the Earth, a
terrible groaning, and a very Thun-
dering, yea, sometimes when there fol-
loweth no Earthquake at all, when
the wind, without shaking of the
earth, findeth a way to passe out at.
And these for the most part, or at least
some of them, are forewarnings, that
the most fearfull Earthquake will fol-
low, then the which there is no natu-
rall thing that bringeth men into a
greater feare. (Cato was very curious to

Thunder-
ing under
the earth

Cato.

D

confesse

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confesse himselfe, that he repented
 ever he went by water, when as
 might have gone by land. But w
 land can be sure, if it be the Lords w
 by this work of his to shake it? w
 building so strong, that can defend
 when the more strong, the more dang
 the higher, the greater fall?

Of Thunder.

Thunder.

THunder is a sound caused in
 clouds by the breaking out of
 hot and dry Exhalation beating again
 the edges of the cloud. It is oft de
 heard in Spring and Summer by reaso
 son that the heat of the Sun then dra
 eth up many Exhalations, wher
 meeting in the middle region of
 Air with moist and cold Vapors, am
 together with them inclosed in a high
 low cloud: but when the hot Ex
 lation cannot agree with the cold
 of the place, by this strife being driv
 together made stronger and kindle
 it will straight break out, which
 den and violent eruption causeth
 noyse which we call Thunder. A

militia

multitude is put by great Authors, of moist wood that cracketh in the fire: A similitude. we may adde hereunto the breaking of an egge in the fire, of an apple or any like thing; for whatsoever holdeth and withholdeth inclosed any hot wind, so that it can have no vent, it will seek it self a way by breaking the skin, shell or case. It were no ill comparison to liken Thunder to the sound of a gun, which be both caused of the same or very like causes.

The sound of Thunder is divers; after which men have divided the Thunder into divers kinds, making first two sorts, that is, smal Thunder and great. But as for the diversity of sounds, generally it comes of the divers disposition of the clouds, one while having more holes then at another; sometime thicker in one place then in another.

The smal or little Thunder is when the Exhalation is driven from side to side of that cloud making a noise, and either for the smal quantity and less forcibleness, or else for the thickness of the clouds walls, is not able to break them, but rumbleth up and down

Divers kinds of Thunders.

Small Thunder, and the kinds thereof.

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down within the cloud, whose sides be stronger then the force of the Exhalation is able to break, it runneth up and down within, and striking against the cloud and moist sides, maketh a noise not unlike the quenching of hot iron in cold water.

And if the Exhalation be meanly strong, and the cloud not in all places of like thickness, it breaketh out at those thin places with such a buzzing as wind maketh blowing out of narrow holes.

But if the cloud be so thin that it cannot keep in the Exhalation, although it be not kindled, then it bloweth out with like puffing as wind cometh out of a pair of bellows.

Great
thunder
and the
kinds
thereof.

A great Thunder is when the Exhalation is much in quantity, and very hot and dry in quality; the cloud is also so very thick and strong, that easily will not give place to the wind, to escape out.

Wherefore if the Exhalation do vehemently shake the cloud, though it do not at the first disperse it, it maketh a long and fearfull rumbling against

be against the sides of the cloud, untill at
the last being made stronger by swifter
up motion, it dissolveth the cloud, and
a hath liberty to pass out into the open
na- Air; the cloud dissolved droppeth
ng down, and then followeth a showre of
Rain.

ly Otherwhiles it shaketh the cloud not
la- long, but straightway rendeth it a long
out space and time, whose sound is like the
uz- rending of a Broad-cloth, which noyse
of continue h a pretty while.

And sometime it discusseth the cloud
it at once, making a vehement and ter-
al- rible crack like a gun, sometime with
w- great force casting out stones, but most
m- commonly fire which setteth many
high places on fire. As in the year of
tha- our Lord 1561. the Fourth day of
ery June, the steeple of Saint *Pauls* Church
al- in *London* was set on fire, as it hath
sily been once or twice before, and bur-
e- ned.

The noyse of Thunder though it be
ve- great in such places over which it is
made, yet is not hard far off, especial-
na- gainst the wind; Whereof we had ex-
a- perience also in the Year of our

How far
thunder is
heard.

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Lord, 1561. on Saint *Matthias* day in February, at the evening, when there was a great flash of Lightning, and a very terrible crack of Thunder following; they that were but 15 Miles from *London* Westward heard no noise nor sound thereof; the Wind that time was Western.

The profit
of thunder

*Plutar-
chus. T.
Quincius
Flaminius.*

The effect of Thunder is profitable to men, both for that the sweet shewre doth follow it, and also for that it purgeth and purifieth the Air by the swift moving of the Exhalation that break th forth, as also by the sound which dividing and peircing the Air, caueth it to be much thinner: which may be verified by an History that *Plutarch* in the life of *Quincius Flaminius* reporteth, that there was such a noyse made by the Grecians, after their Liberty was restored, that the Birds of the Air that flew over them were seen fall down by reason that the Air divided by their Cry, was made so thin, that there was no firmity or strength in it to bear them up. And let this suffice for Thunder, which Lightning succeedeth in treaty, that seldom is from it in nature.

Of Lightning.

AMong the divers kinds of Light. **Lightning.**
 nings which Writers in this
 nowledg do number, we shall treat
 ly of four kinds; yet so, that under
 these Four all the rest may be compre-
 ended. The names we must borrow **Fulgetrū.**
 the Latine Tongue; the first is **Ful-** **Corusca-**
trum, the second **Coruscatio,** the third **rio. Fulgur.**
fulgur, the fourth **Fulmen.** **Fulmen.**

Of Fulgetrum.

Fulgetrum we call that kinde of
 Lightning which is seen on Sum- **Fulge-**
 mer nights and evenings after a hot **trum.**
 day. The generation hereof is such;
 when many thin, light and hot Exha-
 lations by the immoderate heat have
 been drawn up from the Earth, and by
 the absence of the Sun be destitute of
 the force whereby they should have
 been drawn further upward; yet some-
 thing ascending by their own nature,
 in that they be light and hot, they meet
 with the cold either of the night in the

lowest region, or else of the Air in the middle region; and so by resistance of contraries (as it hath been oft before rehearsed) they are beaten back, and with vehement moving set on fire. This Lightning commonly goeth out in the Air terrible to behold, not hurtfull to anything, except sometime when the matter is earthy and gross, being stricken down to the earth, it blazeth corn and grass with other small hurt. Sometime it setteth a barn or thatched house on fire.

The colour of this Lightning.

The Colour of this Lightning as of all other, is divers, partly according to the matter, and partly according to the light. If the matter be thin, it is white; if the substance be gross, it is ruddy, as like flames of fire. In great light as in the day, it appeareth white; in the night, ruddy: yet sometime in the day the time we may see it yellow, which is a token that the matter is wonderful and thick and gross. Old Wives are wont to say that no night in the year except one, passeth without Lightning, but that is true as the rest of their Tales, whereof they have great store.

Of Coruscation.

Coruscation is a glistering of fire, rather than fire indeed; and a glistering of Lightning, rather than Lightning itself: which is two manner of ways: One way, when clouds that be lower then the upper part of the Earth, without the compass of our sight are enflamed, and the reflection of that flame is cast up into our sight, appearing in all points like Lightning, saving that the Air where it appeareth, is so clear, that we are perswaded, no Lightning can be there caused. Another way is, when there be thick clouds over dayes, and commonly a double order of clouds, one above another: if Lightning or any other Inflammation be in the upper part of these clouds, the light of them peirceth thorow the lower parts as thorow a glass, and so appear on earth as though it Lightned, when perhaps it did Lighten indeed, yet that which we saw, was but the shadow thereof: and this is often without Thunder.

Of

*Of Fulgur.***Fulgur.**

The lightning is not before the thunder, though it seeme so.

Sight preventeth hearing.

Fulgur is that kinde of Lightning which followeth Thunder, whereof we have spoken before. For when that violent Exhalation breaks forth, making a noyse as it beateth against the sides of the cloud, with the same violence it is set on fire, and casteth a great light, which is seen far and neer. And although the Lightning appear unto us a good pretty while before the Thunder-clap be heard, yet it is not caused before the noyse, if any Thunder at all follow, but either is after it or with it. Wherefore that we see it before we hear the Thunder, may be ascribed either to the quickness of our Sight that preventeth the Hearing, or else to the swift moving of the fire and the light thereof to our eyes, and the slow motion of the Sound unto our ears and Hearing.

These three kinds of Lightnings are more fearfull then hurtfull, but the fourth seldom passeth without some damage doing.

Of

*Of the fourth kind, called
Fulmen.*

The most dangerous, violent and hurtfull kind of lightning is called *Fulmen*, whose generation is such as followeth: What time a hot *Exhalation* is enclosed in a cloud and breaking the same, bursteth forth, it is set on fire and with wonderfull great force is cast down toward the Earth.

The crack of thunder that is made when this Lightning breaketh out, is sudden, short, and great, like the sound of a Gunne. And oftentimes a great stone is blowne out with it, which they call the Thunder-bolt, which is made in this maner.

In the *Exhalation* which is gathered out of the Earth. is much Earthly matter, which clottering together by coysture, being clammy by nature, consisting of brimstone. and other metallick substance by the excessive heat, is hardened as a brick is in the fire, and with the mighty force of the *Exhalation* strongly cast toward the Earth, and stri-

The thunder-bolt
cast out of
the clouds.

Strongest
things are
most hurt
of light-
ning.

How deep
a thunder-
bolt goeth
into the
earth.

Aristot.
Seneca.
Plinius.

Day light-
ning.

strieth down steeples, and high build-
ings of stone, and of wood, paileth
thorow them, and setteth them on fire
it cleaveth trees and setteth them on
fire: and the stronger the thing is the
resisteth it, the more harme it doth
it. It is sharp-poynted at one end, and
thick at the other end, which is caused
by reason that the moyster part, is
heavier, goeth to the bottome of it; and
is the top small, and the bottome thick.
Men write, that the thunder-bolt
goeth never above five foot deep, where
it falleth upon the Earth: which standeth
with reason, both because the
strength of it is weakned before it
come so neer the ground, and also
because the continual thicknesse of the
Earth breaketh the force, were it never
so great.

Both *Aristotle*, *Seneca*, and *Plinius*
divide this lightning into three kinds.

Of the first.

THe first is drie, which burneth not
to be felt, but divideth and appeareth
with wonderful swiftnesse: For being
subtil and pure, it passeth thorow the

build pores of any thing, be they never so
 small; and such things as give place
 to it, it hurteth not; but such things
 resist, it divideth and peirceth. For
 it will melt money in mens purses, the
 purses being whole and unharmed. Yea,
 it will melt a sword in the scabberd,
 and not hurt the scabberd at all. A wine
 vessel it will cleave, and yet the wine
 will be so dull that by the space of three
 dayes, it will not runne out. It will
 burne a mans hand, and not his glove.
 It will burne a mans bones within him
 to ashes, and yet his skinne and flesh
 shall appeare faire, as though nothing
 were come to him. Yet otherwise the
 whole man in the moment of an houre
 shall be burned to ashes, whereas his
 clothes shall not seeme to have been
 touched. It will also kill the childe in
 his mothers belly, and not hurt the
 mother: And all because the matter is
 very subtile, and thinne, burning, and
 passing thorow whatsoever it be, that
 will not give it free passage.

Money
 melted in
 mens Pur-
 ses, and
 swords in
 Scabberds.

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Of the second kind.

Moyſt
lightning.

Why it
maketh
black.

The Second kinde is moyſt : and
cauſe it is very thin, it burneth
to aſhes, but only it blaſteth or ſc
cheth trees, corn and graiſ: and
reaſon of the moyſtneſs it maketh
things black that it conueth neer,
moyſt wood burning is ſmoaky, a
maketh things neer it to be black a
ſmoaky.

Of the Third kinde.

Groſſe
lightning.

The Third kinde is moſt like o
common fire that wee haue here
the earth of groſs and earthly ſu
ſtance; wherefore it leaveth a pri
where it hath been, or elſe conſumeth
into aſhes, if it be ſuch a body as w
be burned with fire.

*Of the Marvels of Lightning,
and their cauſes.*

The mar-
vell of
lightning.

BEſide the wonderful effects of light
ning, that haue been already
memb

membred, there be many other which hereafter ensue, with the reason and causes unto them belonging; as thus:

The nature of Lightning is, to poyson beasts that are stricken therewith, as though they had been bit by a Serpent. Lightning poysoneth.

The cause of this is, that the matter of Lightning is much infected with Brimstone & other poysonous metallike substance, because it is thin, and giveth them passage into every part of the body.

It is notable, that Seneca writeth, how winevessels of wood being burned with lightning, the wine would stand still, and not run out: the reason hereof, is, the swift alteration and change, whereby also all the clamminesse of the wine is drawne to the outwardmost part, and so keepeth in the wine as in a skin, that by the space of three days it will not run. It will also poyson wine, insomuch that they which drink thereof shall either be mad or dye of it: the cause hereof was sett forth before. Seneca. Wine not running, the Vessels being broken.

Lightning that striketh a poysonous beast, purgeth it from the poyson, in so much that it causeth a Serpent. or Snake. Lightning purgeth a poysonous beast.

A Snake
breedeth
no Worms

Snake which it killeth, to breed wormes which otherwise it would not do : but being purged from the natural poyson by the swift peircing of the Lightning nothing letteth but that it may breed wormes as all other corrupt flesh will doe.

Lightning
openeth
his eyes
that sleep-
eth, and
closeth
his that
waketh.

If Lightning strike one that sleepeth it openeth his eyes; and of one that waketh, it shutteth the eyes. The cause is this, that it waketh him that sleepeth and killeth him, before he can close his eyes againe. And him that waketh it so amazeth, that he winketh, as he will doe at any sudden chance : so he dyeth, before he can open his eyes againe.

Living
things
turn their
face to-
ward light-
ning.

All living things turne their face toward the stroke of the lightning, because it is their nature, to turne their head if any thing come suddenly behind them. The rest that have their face toward it when it commeth, never turne before they be killed.

The Reason why it killeth the child in the mothers womb, not hurting the mother, is the tenderneſs of the one and the strength of the other, when the
Light-

Lightning is not vehement; otherwise both should dye together.

Sometime Lightning burneth onely the garments, shooes or hair of men, not hurting their bodies, and then the Exhalation is nothing vehement.

Sometime it killeth a man, and there appeareth no wound without, neither any hurt within, no not so much as any sign of burning: for then the Exhalation which being kindled is called Lightning, is wonderfull subtil and thin, so swiftly passing thorow, that it leaveth no mark or token behind it.

They that behold the Lightning, are either made blind, or their face swelleth, or they become Lepers; for that Fiery Exhalation received into the pores of their face and eyes, maketh their face to swell and break out into a prosy, and also dryeth up the crystalline humour of their Eyes, so that consequentely they must needs be blind.

Eutropius sheweth that the same day which *Marcus Tullius Cicero* was born, a certain Virgin of *Rome* rising into *Apulia*, was stricken with

Garments burnt, the body unhurt.

Lightning causeth blindness, swelling or Leprosy.

Eutropius.
Marcus Tullius Cicero.
Apulia.

E

Light-

Lightning, so that all her garments being taken from her without any rending, she lay stark naked, the lacing of her breast being undone, and her hose-garters untied, yea her bracelets, collars, and rings being also loosed from her: Likewise her horse lay dead, with his bridle and girths untied.

The wounds of Lightning cold.

The places of them that are burnt with Lightning, are colder then the rest of their bodies, either because the greater heat draweth away the lesser, or else because that by the great violence the vital heat is quite extinguished in that place.

Sea Calfe not hurt with lightning.

The Sea-Calf is never hurt with Lightning: wherefore the Emperours Tents were wont to be covered with their skins.

Bayes and Box Trees seldome hurt with Lightning.

The Bay Trees and Box Trees are never, or seldom stricken with Lightning; The Cause of these may be, the Hardness of their Skins, which hath so few Pore-holes, that the Exhalation cannot enter into them.

The Eagle Jupiters harness-bearer.

The Eagle also among Fowls,

not stricken with Lightning; Where-
fore the Poets feigne, that the Ea-
le carrieth *Jupiters* Armour, which
Lightning. The Reason may be
the thickness and dryness of her fea-
thers, which will not be kindled with
so swift a fire.

Of Storme Winds.

A Storme Wind is a thick Exhala-
tion, violently moved out of a Storme
cloud, without inflammation or bur- winds.
ing.

The Matter of this Storme is all one
with the Matter of Lightning, that
hath been spoken of: namely, it is an
exhalation very hot and dry, and al-
ways gross, and thick, so that it will easi-
ly be set on fire; but then it hath ano-
ther name and other Effects.

The Form or Manner of the gene-
ration is such;

When abundance of that kinde of
exhalation is gathered together within
a Cloud, which needs will have one
way out or other, it breaketh the cloud
and causeth Thunder, as it hath been

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taught before : but if the matter be very thick, and the Cloud somewhat thin, then doth it not rend the Cloud, but falling down, beateth the Cloud before it, and so is carried as an arrow out of a bowe.

It doth always goe before a great sodain showre : For when the Cloud is broken, the water must needs fall down. Also it is so gross and so thick, that it darkneth the Air and maketh all the Lowest Region of the Air to be in a manner as a dark Smoaky Cloud.

It causeth Tempests in the Sea, and a Wonderfull great Danger to them that bear Sayle ; whom if it overtake, it bringeth to utter destruction.

So sodain is this kinde, that it cannot be resisted with sodain helpe : so violent it is, that feeble force cannot withstand it.

Finally, It is so Troublesome with Thunder, Lightning, Rayne, and Beasts : besides these, Darknesse and Cold, that it would make men at so neer a Pinch, to beat their Wits End if they were not accustomed

med to such Tumultuous Tempests.
Wherefore it were profitable to de-
clare the Signes that goe before it,
to the End Men might beware of
it.

But they are so common to other
Tempests, that either they are known
well enough, or else being never
so well known, in a Seldom Calamity
they would little be feared.

The Sea-ships subject to more
Danger, have more Helpe, if it be u-
sed in Time: But no Signes fore-
knowne can profit the Dweller of
the Land to keep his House from
Ruine, except it were to save
his Life from the fall of his Man-
sion.

The sudden violence of this Tempest
to him is more seldome times, but
more incurable when it commeth then
to the Mariner who hath some Ayd to
look for by his comming: the other if
he escape with his life, may comfort
himself that he was neer a great dan-
ger, and cast with himself to build up
his House again.

Of Whirlwinds.

Whirle-
winds.

A Whirlwind, is a Wind breaking out of a Cloud, Rouling or Winding round about, overthrowing that which standeth neere it, and that which cometh before it, carrying it with him alest in the Air.

It differeth from a Stormy Wind in three points.

First, in the Matter which is less in Quantity, and of thinner Substance.

Secondly, in the Moving, which is Circular, Winding about: whereas the Storme bloweth Aslope and Sidelongs. Also a Whirlwind, in the Moving divideth not it self abroad and bloweth Directly, as the Storme doth.

And Thirdly, in the manner of the generation; for a Storme doth always come out of one Cloud; but a Whirlwind sometime is Caused by means of two Contrary Winds that meet together.

In like manner, as we see in the streets of Cities, where the wind is beaten back from two walles, meeting in the midst of the street, there is made a little whirle-wind, which whisking round about, taketh up the dust, or strawes, and bloweth it about, after the very similitude of the great and fearefull whirlwind.

The reason of the going about is this, that when the walls beat back the wind from them, which aboundeth in that place, and those winds when they meet, by reason of equall force on both sides, can neither drive one the other back againe, nor yet passe thorow one the other; it must needs be, that they must both seek a way on the side at once, and consequently be carried round about, the one as it were pursuing the other, untill there be space enough in the aire, that they may be parted asunder.

The matter of a whirlwind, is not much differing from the matter of storme and lightning, that is, an *Exhalation* hote and drie, breaking out of a cloud in divers partes of it, which causeth the blowing about. Also it is cau-

E +

sed,

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The troubles of
whirle-
winds.

sed, as it hath been said, by two, or more
windes, blowing from divers places,
which may be of particular causes, that
have been shewed before in the Chapter
of windes; this tempest is noysome to
man and beast, Sea and Land, things li-
ving, and life lacking: For it will take
up both men and beasts, stones and clods
of earth: which when it hath borne a
great way, will not be so courteous as
to set them downe againe, but negli-
gently letteth them fall from a great
height, or else violently throweth them
downe to the earth.

It breaketh Trees, winding them a-
bout, and pulling them up by the roots.
It turneth about a Ship, and bruieth it
in peeces with other mischiefs besides.

Of fired Worlewinds.

Fired
whirle-
winds.

Sometime a whirlwind is set on fire
within the cloud, and then breaking
forth, flyeth round like a great cart-
wheel, terrible to behold, turning and
overhrowing all drie things that it
cometh neer, as Houses, Woods, Corn,
Grasse, and whatsoever else standeth in
the way.

It differeth not from a whirlwind, having that it is kindled and set on fire, then appearing, else the generation of both is called one.

Of Circles.

The Circle called *Halon* is a garland of divers colours that is seen about the Sunne, the Moon, or any other Star, specially about *Jupiter* or *Venus*, for their great brightnesse. It is called of the Greeks a compassed plat, of the Latines, a Crown or Garland.

Circles about the Sunne, the Moone, and other Starres, Jupiter & Venus Planets.

The matter wherein it is made, is a cloud of equall thicknes, or thinnesse, coming directly under the body of the Sunne, the Moone, or other Starres, into which the light of the heavenly body is received & so appeareth round, because the Starre is round: as a stone cast into the water, maketh many round circles, dilating in breadth, untill the violence of the moving is ended; so is it in the aire; the light beames peircing it, cause broad circles to be dilated, which appeare white, purple, black, red, green, blew, and other colours, according

Circles in the water.

The colours of circles.

according to the disposition of the cloud matter. The cause of such colours, is shewed before in the peculiar treaty of colours.

This circle is oftner scene about the Moone, then about the Sunne, because the heate of the Sunne draweth the vapors too high, where it cannot be made. Also, because the night is a more quiet time then the day from wind, it is more often in the night, then in the day. Seldome, about other Starres, because their light beames, are too weake often to pierce a cloud: yet oftner about small stars then the Sunne, because the light of the Sunne pierceth the cloud more forcibly, than that this *Halo* can many times be cause.

Circles at
bout a
candle.

Otherwhiles it is seen about a candle, which must be in a very thicke and grosse aire of such proportionate thicknes, that it may receive the light as the cloud doth from the starres, as in the smoaky places, or hot houses.

This kinde of circle is sometime like a Rainebow, saving that it is whole circle unless the starre under which it is caused, be not all risen,

the cloud, in which it is seen, be not The signes
come under the Star, or after it hath of these
come under some part therof, be dissol- circles.
ed from the rest.

These Circles be signs of tempests and Virgilius,
indes, as witnesse both *Virgil*, and *A-* Aratus,
ulus. Poets.

The Wind shal blow from that quar-
ter, where the Circle first beginneth
to break. The cause whereof is this, that
the Circle is broken by the Winde that
is above which is not yet come down
towards us, but by this effect above; we
may gather, both that it will come, and
also from what quarter.

A great Circle about the Moon, be-
okeneth great cold and frost to follow Signe of
Frost.

But if it vanish away and be dissol- Signe of
ed altogether, it is a signe of faire wea- faire wea-
ther. ther.

If it be broken in many parts, it signi- Signe of
feth tempest. tempest.

If it wax altogether thicker and dar- Signe of
ker, it is a forewarning of raine. raine.

One alone, after *Ptolomee*, pure and
white, vanishing away by little and lit-
tle, is a token of faire weather. Ptolome-
us Signe of
faire wea-
ther.

Two

Signe of
Snow.

Two or three at once, portende tempest: if they be ruddy, they shew wind to come; and toward snow, they seem as it were broken and rocky.

Being darke or dimme, they signify all these foresaid events, with more force and abundance; it is oftner caused in *Autumne* and Spring, then in Winter or Summer: the cause is the temperatenesse of the time.

Aristotle.
Antipho.

The cause why it appeareth sometime greater, and sometime lesser, is in the quality of the matter, which as it is grosse or thinne, will more or lesse be dilated and stretched abroad, & also some will have it, of the weakenesse of mans sight. Of which, *Aristotle* bringeth an example in one *Antipho*, which did alwayes see his owne image before him in the ayre, as in a glasse: which he affirmeth to have been for the weakenesse of his sight-beames that could not pierce the aire, so that they were reflected again to himself.

And thus much for *Halon*, and the causes, signes, or tokens of it.

Of the Rainebow

The Rainebow, is the apparition of Raynebow
 certaine colours in a cloud, oppo-
 site against the Sunne, in fashion of half
 Circle. *Possidonius* said, it was the Posside-
 nes looking glasse, wherein his i-
 Winge was represented, and that the blue
 our was the proper colour of the
 red of the Sunne; all the other
 colours of commixtion.

It differeth manifoldly from *Halon*:
 the Raynebow is alwayes opposite
 against the Sunne: but *Halon* is directly
 under it.

They differ not onely in place, but
 in fashion: the Raynebow is but
 half a Circle: the *Halon* is a whole
 Circle.

Likewise they vary in colour: for
 the Raynebow is more dimme, and of
 purple colour; the *Halon*, whiter and
 brighter.

Also, in continuance; for the Rain-
 bow may continue longer then *Halon*.

The image of the Rainebow may be
 seen on a wall, the Sunne striking thro-
 w a fix poynted stone, called *Iris*, or
 any ed *Iris*.

any other Christall of the same fashion
also throw some glasse window.

Halon is seen about Candles, in sm
kie places, as are baths and kitchings.

A simili-
tude.

The manner of the generation of the
Rainebow is such; There is opposite
gainst the Sunne, a thick watery cloud
which is already resolved into dew
drops of raine, is (for a grosse simili-
tude) is scene on the potlid, when the
Water in the Vessell hath sodden, and
is very hot, the lid will be all full of
small drops of water, which come from
the water in the Vessell; first, by heat
resolved into smoake; after, when it
cannot goe at large, it is resolved again.
Wherefore upon such a cloud, the
Sunne beams striking, as upon a smooth
glasse, do expresse the image of the Sun
unperfectly, for the great distance.
Or else the Sunne beames striking into
a holow cloud, where they are refracted
or broken, and so come to the eyes of
him that beholdeth the Rainbow.

The simili-
tude of
the Raine-
bow.

The similitude thereof is seen, when
men saile or row in Boats, the Sunne
shineth upon the water, which casteth
on the vessels side, the colours and
image of the Rainbow. Like

Likewise, water in an urinall holden
against the Sunne, receiveth the light,
and sheweth colours on the wall.

There be two kinds of Rainbows,
one of the Sun, another of the Moon;
the one by day, the other by night: the
Rainebow of the Sun often, but of the
Moon very sel some, in so much that it
can be but twice in fifty yeeres, and that
when the Moon is in the East or West,
all in perfect opposition.

Rainbow
of the Sun.
Rainbow
of the
Moone.

It hath not been many times scene
since the writing of Histories, yet some-
times, and for the rarenesse, is taken for
great wonder. Yet is it in colour no-
thing so beautiful as the sunnes, but for
the most part white as milke: other di-
versities of colours are scant perceived.
When it appeareth, it is said to signifie
tempest.

The time of the Rainbow is often af-
ter the point of *Autumne*, both for the
placing of the Sunne in competent low-
nesse, and also for abundance of mat-
ter, seldom or never is the Rainebow
about the midst of Summer.

There may be many Rainebows at
the time, yet commonly but one prin-
cipall,

any other Christall of the same fashion
also throw some glasse window.

Halon is seen about Candles, in sm
kie places, as are baths and kitching

A simili-
tude.

The manner of the generation of the
Rainebow is such: There is opposite
gainst the Sunne, a thick watery cloud
which is already resolved into dew
drops of raine, is (for a grosse simili-
tude) is scene on the potlid, when the
Water in the Vessell hath sodden, and
is very hot, the lid will be all full of
small drops of water, which come from
the water in the Vessell; first, by heat
resolved into smoake; after, when it
cannot goe at large, it is resolved a-
gain. Wherefore upon such a cloud, the
Sunne beams striking, as upon a smooth
glasse, do expresse the image of the Sun
unperfectly, for the great distance.
Or else the Sunne beames striking into
a holow cloud, where they are refracted
or broken, and so come to the eyes of
him that beholdeth the Rainbow.

The simili-
tude of
the Raine-
bow.

The similitude thereof is seen, when
men sayle or row in Boats, the Sunne
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There may be many Rainebows at
one time, yet commonly but one prin-
cipall,

Rainbow
of the Sun.
Rainbow
of the
Moone.

cipall, of which the rest are but shadows and images; the second shadow of the first, the third of the second as appears by placing of their colours.

It remaineth to shew why it is but halfe a circle, or lesse, and never more and why the whole cloud received not the same colours that the Raynebow hath. The cause of the first is, because the center or middle part of the Raynebow, that is *Diametrally* opposite to the center of the same, is always either in the *Horizon* (that is, the circle cutting off our sight of Heaven by the earth) or under it. The cause why the whole cloud is not coloured, is, because that in the middle, the beames are strong, pierce thorow, but on the edges where they are weaker, they are reflected or refracted.

Now for so much as GOD made the Raynebow a sign and Sacrament of the promise, some think it was never seen before the flood: their reason may be this, that the earth, after the first creation was then so fruitfull, that it needed none or very little Raïne, so that such dark clouds were not often gathered,

the

the fruitfull ground not so easily remitted his moysture, that then was fat and clammy, hard to be drawne up: so it might be, that there was no Rainebow before, as we cannot find that ever it rained before. But whether it were or not, it is certaine, that then it became Sacrament, whereas it was none before: which when we behold, it beho-
 of us to remember the truth of God
 all his promises, to his glory and our
 comfort.

*The milke way, called of some the
 way to S. James, and Wat-
 ling Streete.*

The milke way is a white circle seen in a cleare night, as it were in the
 mament, passing by the fings of *Sagit-
 rius* and *Gemini*.

The white
 circle seed
 in the
 night

The cause thereof is not agreed upon among Philosophers, whose opinions thought best to report, before I come to the most probable causes.

First of all, *Pythagoras* is charged with a Poeticall fable, as though it had
 en caused by reason that the Sun did

pythagoras

F

once

once run out of his path way, and burn
ned this part, whereof it looketh white

Anaxa-
goras
Democri-
tus.

Others, as *Anaxagoras* and *Democritus* sayd, that it was the light of certaine Starres, shining by themselves of their owne light, which in the absence of the Sun might be seene. But this opinion is also false; for the Starres have no light of themselves, but of the Sun: also if it were so, it should appeare about other Starres.

Cardanus.

Democritus is also reported to have said, that it was nothing else but innumerable little Starres, which with their confuse light, caused that whitenesse to this opinion, *Cardane* seemeth to subscribe.

Phaeton.

The Poets have foure fables of the one of *Phaeton*, which on a time guided the Chariot of the Sunne, and wandering out of the way, did burne the place, wherefore of *Jupiter* he was stricken downe wth lightning.

Ovid.

Mesa. Pt.

The second, That it is the high street in Heaven, that goeth streight to *Jupiter*'s palace, and both sides of it the common sort of gods doe dwell.

Hebe.

The third, that *Hebe*, one which was

Jupiter's Cupbearer, on a time stumbled at a straw, and shed the Wine or like that was in the Cup, which coloured that part of Heaven to this day: therefore she was put out of her office. The fourth, That *Apollo* stood there *Apollo*, fighting against the Giants, which *Jupiter* made so appear, for a perpetual memory.

Theophrastus, a Philosopher, affirmed *Theophrastus*. That it was the joyning together, or come of the 2 half Globes, which made appeare more light in that place then others.

Others said, it was the reflexion of the shining light of fire or starre light, it is seen in a glasse, but then it should moveable.

Diodorus affirmed, that it was *Hea-* *Diodorus*. ally fire, condensed or made thick in a circle, and so became visible, whereas the rest, for the pureness, clearness, and thinness, could not be seen.

Possidonius, whose mind to many *Possidonius*. seemeth very reasonable, said, it is the confusion of the heat of the Stars, which therefore is in a Circle, contrary to the *Zodiake*, (out of which the Sun never *Zodiake*.

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wandereth) because it might temp
the whole compass with vital and live
hea , Although in my mind he hath
ther expressed the finall cause, then
efficient.

Aristotle.

Aristotles opinion is, that it should
the beames of a great Circle which
caused by a cloud or *Exhalation* draw
up by those Starres, which be call

Sporades.

Sporades. This opinion of *Aristotle*
misliked of most men that have tr
vailed in this science ; and worthil
For if it were of the nature of e
ments as *Exhalations* are, it would
at length consumed. But this cir
never corrupteth, therefore it is not
Exhalations. Also it neither increas
nor diminisheth, which is a plain pro
that it consisteth not of elemental m
ter, although *Aristotle* seem to mak
double circle, one celestially, another
elemental.

The last opinion is, of them that
it is the nature of heaven, thicker
substance, then other parts of Heav
be, having some likenesse to the su
stance of the Moon, which being light
ned by the same as all the Starres

appeareth white. And this opinion I
make to be most probable, because that
the sentence of Starre light seemeth not so
reasonably, to be only in that place, and
not elsewhere.

The finall cause of this Milke-white
circle, hath beene already touched in
the opinion of *Possidonius*, whereunto
also *Plinius* in the 18. Book, and 29.
chapter of his natural History agreeth,
affirming, that it is very profitable for
the generation and fruitfull increase of
things that grow on the ear h.

The *Mathematitians* that have mea-
sured the breadth thereof, affirme, that
toward the north it passeth over the E-
quiptical line of the ninth spheare, from
the 18. degree of *Gemini*, unto 2 degrees
of *Cancer*, which is 13. degrees and to-
ward the South, from the 8 degree of
Sagittarius, to the 13 degree of the
same signe: and because it is there divi-
ded into two branches (as may easily
be seen in a cleare night) it reacheth
from 24 of *Sagittarius*, to the 2 degree
of *Capricorne*.

This circle, if it be of the nature of
heaven, is improperly placed among

*Possido-
nius
Plinius*

The
breadth of
this circle;

Meteors or impressions : but because of *Aristotles* mind, who will have it be an impression kindled, and their opinion which think it proceedeth from the light of *Starres*, it is not without good cause in this place treated of.

Of beames, or streames of light, appearing thorow a Cloud.

Beames or
streames.

THere is yet another kind of impression caused by the beames of the Sunne, stricken through a wat cloud, being of unequall thinnesse, and is thinner in one part then in another so that it cannot receive the beames in any other forme, then that they appeare direct or slope downward of divers colours; and the same that are the colours of the Rainebow, though not so evident, because the reflexion is not so strong. They vary in colours, some are more purple or ruddy, when the cloud is thicker; some yellow and whitish, when the cloud is thinner, and so other colours are caused likewise whereof you may read the proper cause

because in the colours of clouds and other like
ve it parts of this Treatise.

heir The common people call it the de-
eth ascending of the holy Ghost, or our La-
witho dies *Assumption*, because these things
d of are painted after such a sort. Others
ay that it is raine, striking down in a-
ap- nother place, as though they could
see the drops falling. And they are not
altogether deceived, but in the time;
of in for soon after it will raine, because
nes of this impression appeareth out of a wa-
vat ry cloud. They are called by divers
se, an names, 'as Rods, Wands, Cords of
othe Tents, unto which they are not much
eame anlike staves and little pillars, when they
t the seeme greater and thicker, many being
rd ioyned together.

at an The Rainebow, the Circles, and these
ough light Beams, are all of one manner of
ion generation, in so much that if you di-
ours vide the Circle, it shall be a Rainbow;
when if you draw it streight in length, it ma-
an keth streames or beames. Herein they
r, an agree, namely, in forme and matter,
w ife but they differ in outward form, which
cause we may call fashion, as the one is round,
the other halfe round, and the third

direct, straight or falling aslope. Also they differ in place about which they stand : for streames are onely about the Sunne; Rainebowes about the Sunne often, and seldome about the Moon but circles both about the Sunne and the Moon, and also about any other of all the Starres, yet rather and oftner about bright Starres.

To make an end of these streames they appeare diversly, after the fashion and place wherein the cloud hangeth, in respect of the sunne ; for sometime they are seen only in the edge of a cloud, along the breadth of that cloud : sometime thorough the midst of a cloud, being thinner there then in other parts, and then they are spread round about like a tent or pavilion used in War. They are most commonly seen in such times as there is great abundance of raine, which they by their apparition do signifie notwithstanding yet to be ended.

And thus much concerning direct light beames, called Roddes, &c.

Of many Sunnes.

It is strange and marvelous to behold the likelyhood of that which Alexander the Great, sending word to Darius, said to be impossible, that Two Sunnes should rule the World. But

Many Sunnes at once. Alexander the great. Darius.

Sometimes, men have seen, as they be thought in the firmament, not only two Sunnes, but oftener three Sunnes, and many more in number though not so often appearing. These, how wonderful, albeit soever they appear, proceed of a natural cause, which we wil endeavour to expresse. They are nothing else but idols or Images of the Sun, represented like an equall, smooth, and watery cloud placed on the side of the Sunne, and sometimes one both sides, into which the Sunne beams being received, as in a looking glasse, expresse the likenesse of fashion and light that is in the Sunne appearing as though there were many Sunnes, whereas indeed there is but one, and all the rest are images.

This thick and watery cloud, is not said to be under the Sunne; for then it would

would make the Circles, called crowns or garlands: it is not opposite to the Sunne, for then would it make the Rainbow: but it is said to be on the side where the image may be best presented. Also it may not be too far off, for then the beams will be too feeble to be reflected: neither yet too near for if it so be, the Sunne will disperse it: but in a competent and middling distance: for so representation of many Sunnes is caused.

They are most often seene in the morning and evening, about the rising or going down of the Sunne, seldome at noone time, or about the midst of the day, because the heat will soon dissolve them: yet have there been some seen, which began in the morning, and continued all the day long, unto the evening. Somtimes there appeare many little Suns, like unto little starres, which are caused after the same sort as we doe see a mans face to be expressed in all the pieces of a broken glasse. So when the cloud hath many separations, there appeare many Sunnes, on one side of the true Sun, somtimes great and somtimes

Many small
Sunnes
like stars.
Similitude.

times little, as the parts of the cloud
to separated are in quantity.

They do naturally betoken tempest
and rayne to follow, because they can-
not appeare but in a watery disposition
the Ayre.

The signi-
fication of
many
Sunnes.

Also, if they appeare on the South-
side of the Sunne, they signifie a greater
tempest, then if they appeare on the
North-side. The reason is alleadged,
because the Southerne Vapor is sooner
resolved into Water then is the Nor-
therne.

For a supernaturall signification,
they have oftentimes been noted to
have portended the contention of Prin-
ces of kingdomes: As not long before
the Contention of *Galba*, *Otho*, and
Vitellius for the Empire of Rome,
there appeared three Suns. Also of late,
toward the slaughter of *Lewis* King of
Hungary, were seen three Suns, betoke-
ning three Princes that contended for
the kingdome, namely *Ferdinando*
since Emperour, *John Vayvode*, and the
great Turke.

Galba,
Otho, and
Vitellius.

Of

Of many Moones.

Many
Moones.

After the treaty of many Suns, were not hard for any man without farther instruction to know the natural Cause of many Moons; For they are likewise Images of the Moon, represented in an equal Cloud, which is watry, smooth and polished, even like a glass.

Plinius.

Some call them (as *Plinius* saith) night-Suns; because they, joined with the light of the true Moon, give a greater shining light, to drive away the shadow and darkness of the night.

It were superfluous to write more of their Causes or Effects, which are all one with those that have been declared of the Suns,

Why other stars are not so represented.

It may be doubted why the other stars do not likewise express their image in watry Clouds; and so the number of them, as to our sight, should be multiplied.

It may be Answered that their light or beams are too feeble and weak to express any such Similitude or likeness in

the

newatry Clouds. For although they have garlands or circles about them, that are caused in a Vapour that is under them, yet it is manifest that this apparition hath not need of so strong light as is required to print the images of them in the Clouds. Again, the Garlands are direct under, and therefore apter to receive such Apparition.

It may be again Objected that the Stars have their Image perfectly and sufficiently expressed in glasses here on the Earth; yea and at the day-time, when their light is either none, or most feeble and weak: as we see it is used at Midsummer to behold that great star called *Syrus* in a glass even at Noon-days.

Objection.

Also we see every night the Image of the Stars in calm and quiet standing waters: then what should let but that their images might also be expressed in watry Clouds?

Syrus a great Star seen at noone in Summer.

Hereto may be answered that the Let is in the Cloud, which is neither so hard as is the glass, nor yet so continual as is the water, but consisteth of in-

An answer.

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innumerable smal drops : so that except the light of the stars were stronger, it can in them expresse no uniform images of them, as it doth in glasse and in the water. Notwithstanding, in Writers of Wonders we read some such like thing sometime to have changed.

There hath been often seen many Suns in the day-time and after the Sun setting : at the rising of the full Moon there have appeared many Moons which was by this means, that the same Cloud that received the Sun-beams in the morning, tarried in the same place and at the Moons rising was ready also to receive her image.

Of Wonderfull Apparitions.

Wonder-
full appa-
ritions.

WE will close this Book with a brief declaration of the natural Causes of many things that are seen in the Air, very wonderfull and strange to behold, which in these latter Years have been often seen and beheld to the great admiration of all men, notwithstanding the singular providence of God, to fore

renewe us of many dangers that
hang over us in these most Perillous
times.

The apparitions of which, as it is
most wonderfull, so the searching of
the Cause to us is most difficult: a great
deal the rather, because no man hath
hitherto enterprised (to my know-
ledge) to seek out any cause of them,
but all men have takⁿ them as imme-
diate miracles, without any natural
meanes or cause to procure them.

And I truly do acknowledge that
they are sent of God as wonderfull signs
to declare his Power, and move us to a
amendment of life; indeed miraculous,
but not yet so that they want a natural
cause; for if they be well weighed and
considered, it is not hard to find that
they differ much from such Miracles as
are recorded in the Scripture and ad-
mitted of Divines. So that as I ab-
horre the Opinion of *Epicurus* to think
that such things come by Chance, but
rather by the determined purpose of
Gods providence: so I consent not
with them that suppose when any
thing is derived from any natural caus,
God

God the chief and best Cause of all things is excluded.

Some of these Wonderfull Apparitions consist of Circles and Rainbows of divers fashions and placings, as one within another, the edge of one touching another, one dividing or going thorow another, with like placing of small Circles about great Circles or parts of small Circles, some with the ends upward, some downward; some aside, and some across; but all for the most part in uniform order constituted or placed for the order of them pleasant to behold, but for the strangeness somewhat fearfull. Such a like Apparition is made with the Suns or Moons images joined unto these Circles set also in good and uniform order.

The cause of all these is the meeting together of all those several Causes that make the Circles, Rainbows, Streames and Images of the Sun or Moon, which joined all together, make the wonderfull sight of Rainbows, positions of Circles, Crosses and diverse Lights which pertain to the knowledge of Optice and Catoptrice that teach

now by divers refractions and reflections of beams such visions are caused. So that he which will know how they are generated, must return into the several Treatises of Rainbowes, Circles, Streams & Images of the Sun or Moon: and if in them he find not knowledge sufficient to instruct him, I must send him to the Demonstrations of Perspective, where he shall want nothing.

Another sort of them, no less often beheld within these few years then the former, but a great deal more strange and wonderfull to look upon, are the sights of Armies fighting in the Air, Castles, Cities and Towns, with whole Countries, having in them Hills, Vallies, Rivers, Woods, also Beasts, Men and Fowls, Monsters of which there are no such kindes on the Earth; and finally all manner of things and actions that are on the Earth, as Burials, Processions, Judgments, Combates, Men, Women, Children, Horses, Crowns, Armes of certain Noble men and Countries, Weapons of all sorts, sometimes Stars; Angels as they are painted with the Image of Christ crucified,

fied, beſieging of **Cafles** and **Townes**, many things and geſtures done by men or beaſts, the very Similitude of Perſons known to the Beholders; as of late was ſeen the very Image of the Emperour *Charles*, in ſomuch that they which beheld it, put off their Capes thinking verily it had been he: and *John Frederick* Prince Elector of *Saxony*, who that time was Priſoner with the Emperour: Alſo the Image of ſmall Croſſes, which hath been not only in the Air, but alſo on the Earth, on men's apparell, on diſhes, platters, pots, and all other things, ſo that the Jewes have been full angry that they could neither waſh nor rub them out of their apparell. In *Germany* alſo Fires and many ſuch things as it were long ſtoried ſeen in the Air.

All theſe wonderfull Apparitions may be cauſed two manner of wayes, the one Artificially, the other Naturally.

Artificially, by certain glaſſes and Inſtruments made according to a ſecret part of that knowledg which is called *Catoptrice*; and ſo peradventure ſome

of them have been caused ; but

The most part (doubtless) Naturally, when the disposition of the Air hath been such, that it hath received the image of many things placed and done on Earth.

And because it is apt to receive divers images, as well in one place as in another, these monstrous forms and strange actions or stories proceed of the joining of divers forms and actions : as if two Histories were confusedly painted in one, the whole Picture would be strange : or (as the Poet saith) if a painter, to a mans head, should sett a horses neck, and after, divers feathers. Sometimes also one image is multiplied in the Air into many or infinite, as are letters and crosses which fill the Air, even beneath : And the light of the Sun received into little parts, maketh to appear as it were many smal stars.

Horatius.

Let this suffice concerning these wonderful Apparitions : once again admonishing the Reader, though I have surpris'd to declare these by natural reason, yet verily believing that not much as one Sparrow falleth to the

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ground without Gods providence.
do also acknowledg Gods providence
bringeth these to pass, to such ends as
before I have shewed, using these causes
as meanes and instruments to do
them.



The Fourth Book.

Of Watery Impressions.



These be Watery Impressions that consist most of Earth and Water.

In the Treaty of these are wont to be handled these Impressions; namely, Clouds, Rain, Dew, hoar Frost, Hail, Snow, Springs, and the great Sea it self.

Of Clouds.

A Cloud is a Vapor cold and moist, drawn out of the Earth and Waters by the heat of the Sun into the middle region of the Air; where by cold it is so knit together, that it hangeth untill either the weight or some resolution causeth it to fall down.

The place wherein the Clouds do hang, is said to be in the middle region of the Air, because men see it is necessary that there should be a cold which should make those Vapors so gross and thick, which for the most part are drawn so thin from the Earth, that they are invilible as the Air is.

And although they are known often times, as *Aristotle* witnesseth, to be in the lowest region of the Air, neer to the Earth, insomuch that sometimes they fall down to the Earth with great noise, to the great fear of men, and no less loss and danger: yet may it be reasonably thought that these Clouds were generated in the middle region of

Astritor.

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the Air far distant from the Earth which by their heaviness do by little and little sink down lower into the lowest region, and sometimes also fall down to the Earth.

The height
of the
Clouds.

The Common Opinion is, that they goe not higher then nine mile; which because it leaneth to no reason, is uncertain.

Albertus
Magnus.

Albertus Magnus whose reason also is to be doubted of, affirmeth that the Clouds do scarce exceed Three mile in height when they are highest.

And some let not to say that oftentimes they ascend not past the half of One mile in height.

Again, Others pretending to find out the truth by Geometrical Demonstrations, make it about Fifty mile to the place where the generation of Clouds is.

How these men take the distance from the Earth, it is uncertain: whether that they assigne the least distance and meane it from the highest parts of the Earth as are hill tops, or from the common playn.

Again, whether they that assign the highest

of Meteors.

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the highest distance to be from the lowest valleys of the Earth, or from the hill tops.

The Reason before shewed, moveth me to think that the most usual and common generation, I mean the condensation or making thick of these thin Vapors into Clouds, is in the middle region of the Air: but for the distance of the Clouds when they be generated, I think they be sometime Nine mile, sometime Three mile, sometime Half a mile, and sometime less then a Quarter of a mile from the Earth.

Of Mists.

There be Two kinde of Mists; the one ascending, the other descending.

That which ascendeth, goeth up out of the Water or the Earth as Smoak, but doth not commonly spread over all other parts: it is seen in Rivers and moist places.

The other Mist that goeth down toward the Earth, is when any Vapor is

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lifted up into the Air, by the heat of the Sun, which being not strong enough to draw it so high that the Cold may knit it, suffereth it after it is a little made thick, to fall down again, so filleth all the Air with the gross Vapors, and is called Mists, being usually a Sign of fair Weather.

Of empty Clouds.

Empty
clouds.

THERE be certain Cloudes that are empty, and send no Rain; these come of two sorts.

One sort are the Remnants of a Cloud that hath rained, which cannot be converted into water for their dryness.

Another sort is of them that are drawn up out of wet and dry places, and be rather Exhalations then Vapors; that is, they be dry, hot and light, so that it were hard for them to be turned into Rain: they look white like flocks of wooll, when the light striketh into them.

There be also empty Clouds, which when the Winds have dispersed abroad

ny Cloud, are scattered over all the
y: but these Clouds though for a
me they be empty, yet because they
onfist of such a substance as is watry,
ey may be, and are oftentimes ga-
ered together, and give plentifull
ain.

Of the Colours of Clouds we have Of the co-
oken in the Second Book of Fiery lours of
eteors, where those Colours and the Clouds.
uses of them are described, which
em to be Fiery, or may be thought to
e Inflammations or burnings, as to
e Red, Fiery and Yellowish.

But besides those there be White,
ack, Blew and Green.

White clouds be thin, and not very
Watry; so that the light received in
them, maketh them to appear White.

Black clouds be full of thick, gross
and earthly matter that makes them
look so dark.

Blew clouds be full of thick dross
and earthly, as the Black: so the light
received in them, maketh them to seem
blew.

Green clouds are altogether watry,
esolved into water, which receiving
into

Into them the night, appear Green
Water doth in a great vessel, or in
Sea and Rivers.

Of Rayne.

Raine.

After the generation of clouds
well knowne, it shall not be hard
to learne, from whence the Rayne
commeth.

For after the matter of the clouds
being drawne up, and by cold made
thick (as is said before) heat following
which is most commonly of the South
erne wind, or any other wind of hot
temper, doth resolve it againe into
Water, and so it falleth in drops, to
give increase of fruit to the Earth, and
move men to give thankes to God.

There be small showers of small
drops, and there be great stormes of
great drops.

The showres with small drops, proceed
either of the small heat that resolvet
veth the clouds: or else of the great dis
ance of the clouds from the Earth.

The streames with great drops come
trariwilt

ariwise doe come of great heat, resol-
ing or melting the cloud, or else of
small distance from the Earth. Where-
of we see a plaine experiment, when
Water is powred forth from an high
place the drops are smal, but if it be not
from high, it will either have no
dropes, or very great.

The caus why raine falleth in round
drops, is both for that the parts desire
the same forme that the whole hath,
which is round, and also that so it is
best preserved against all contrary qua-
lities: like as we see Water powred upon
dry or greasy things to gather it selfe
into roundels, to avoid the contrariety
of heat and drynesse.

It is not to be omitted, that raine why rain
Water, although a great part of it be water is
drawne out of the Sea, yet most com- not salt.
only it is sweet not salt.

The caus is, becaus it is drawn up in
such small *Vapors*, and that salt part is
consumed by the heat of the Sunne.

The raine water doubtlesse doth more
increase and cherish things growing on
the Earth, then any other Water where-
with they may be Watered, becaus the
raine

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raine Water retaineth much of the Sunnes heat in it that is no small comfort to all growing plants. The Water that commeth from Heaven, in rain will sooner come to putrefaction, & stinking, then any other, because it hath been made very subtil by heat, and also for that it is mixed with many Earthly and corruptible substances.

Avicen. Rain water, that falleth in the summer by *Avicens* iudgement, is more wholesome than other Water, because it is not so cold and moyst as other Waters be, but hotter and lighter.

Salt raine. Sometime there is salt rayne, where some *Exhalation* which is hot and dry is commixed with the *Vapor* where the rayne consisteth.

Bitter raine. Sometime it is bitter, when some burnt Earthly moystre is mixed with it.

This rayne is both unwholesome and also unfruitfull. In these countreyes there is great store and plenty of rayne because the Sunne is of such temperate heate, that it gathereth many *Vapors* and by immoderate heat doth not consume

me them. But in the East parts, In
me hot Countrys, it never or seldom
seen to rayne, as in Egypt and Syria,
it in stead of rayne, Egypt hath the
River *Nilus*, whose overflowings doe
marvilously fatten the Earth. In Syria The River
Nilus.
and other like Countries they have
more plentiful dew then we have,
which doth likewise make their Earth
exceeding fruitful.

Seneca testifieth that the Rain soak-
eth no deeper into the Earth then ten
foot deep. Seneca.

Of the Signes of Rain.

First, If the Skie be red in the morn- Signe of
ing, it is a token of Rain, because Raine.
those Vapors which cause the Redness,
shall be shortly resolved into Rain.

If a darke cloud be at the Sun rising,
which the Sunne soon after is hid, it
shall dissolve it, and rayne will follow.
then appeare a cloud, and after,
vapors are seen to ascend up to it, that
tokeneth rayne.

If the Sunne or Moone looke pale,
looke for rayne-

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If the Sunne in the East seem greater
then commonly he appeareth, it is
signe of many *Vapours* which will bring
rayne.

If the Sunne be seen very rarely,
few Stars appeare in the night, it be-
keneth rayne.

The often changing of the Wind
also sheweth tempest.

The most sure and certaine signe
of raine is the Southerne wind, which
with his warmenesse, alwayes resolvet
the clouds into raine.

When there is no dew at such time
as by nature of the time there should
be, raine followeth: for the matter
the dew is turned into the matter
watry Clouds.

If in the West, about the Sunne set-
ting there appeare a black cloud,
will rayn that night, because that cloud
shall want heat to disperse it.

When much dust is raised up, and
when the woods make a great noise,
some tempest is towards.

Hard stones will be moyst, and
sweate against rayne: lamps and can-
dles by sparkling, frogs crying, Trees
breakin

of Meteors.

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aking, leaves falling, and dust clot-
ring, forewarne us of tempest.

Fleas, flyes and gnats, bite sore to-
ward a tempest, Kine feed greedily,
birds seeke their victuals more busily:
in the grosse Ayre disposed to rayn,
their stomacks are hotter, and they
more hungry. But these kind of signes
ertaine not so properly to *Meteoro-*
logy, as to Mariners and Husbandry,
which have a great many more then
these. And *Virgil* in the first booke of
Georgiques, hath a great number for
them that list to learn. Wherefore let
these hitherto suffice.

Of monstrous or prodigious rayne.

Hitherto we have made mention
onely of naturall rayne, and that Of Mon-
which is common, which no man doth strous
marvell at. But there is some time such Rayne,
rayne, that worthily may be wondred
at: as when it raineth wormes, frogges,
bees, blood, milke, flesh, stones wheat,
iron, wooll, bricke, and quicksilver.
For historie maketh mention, that at
seuerall times, it hath rayned such things
whose

Worms &
Frogs.

whose naturall caus, for the most part we will goe about to expresse, notwithstanding, accounting them among such wonders, as God sendeth to be considered for such ends, as we have before declared, Wormes and Frogs may thus be generated: The fat Exhalations are drawn up into the Ayr, by a temperature of hot and moyst, from whence vermine may be generated in the Ayr, as they are one the Earth, without copulation of male and female. Or that with the Exhalations and Vapors their Seed and Egges are drawn up, which being in the clouds brought into form, fall down among the rain.

Fishes.

Milke.

Likewise the spawn of fishes, being drawn up, maketh fishes to rain out of the clouds. The vehement heat of the Sunne in Summer, and specially in hot Countries, draweth milke out of the Paps of Beasts and Cattell, which being carried up in Vapors, and dissolved againe into milke, falleth downe like rain.

Blood.

After the same manner, the Sunne draweth up great quantity of blood, and so it raineth blood.

It raineth flesh, when great quantity of blood being drawn up, it is clotted together, and seemeth to be flesh.

Avicen saith, That a whole Calfe sell of the Air; and some would make seem credible, that of Vapors and exhalations, with the power of heavenly bodies concurring, a Calfe might be made in the Clouds. But I had rather thinke, that this Calfe was taken up in the storme of Whirlwinde, and so let fall again, then agree to so monstrous a generation.

It is a great deale more reasonable, that stones of earthly matter gathered in clouds, should be generated as we see before of the Tunder-bolt, Yet some men think, that wind in Caves of the Earth breaking upward violently, carryeth before it, earth and stones into the aire, which cannot long abide, but fall down, and are counted among prodigious raine. Exhalations that be thickly and drawn out of clay, have much grosse substance in them, which gathered together, and by great heat condensed in the clouds, make brick, which is no great marvell.

H

He

Wheat.

He that hath seen an Eggs-shel full
dew drawn up by the Sun into the Air
in a May morning, will not think it
credible, that Wheat and other Gra
should be drawne up in much ho
Countrie then ours is, much rather
the Meale or Flower which is lighter.

Wooll.

A certaine moistnesse, like Wooll,
is upon Quinces, Willowses, and other
young Fruits and Trees, is draw
up of the Sunne among the Vapors
and Exhalations, which being clotted
ed together, falleth downe like locke
Wooll.

Quicksil-
ver.

Quicksilver, all men know will
small heat, will be resolved into
thin Vapors, whereof when quantity
drawne up, it falleth downe againe.
As it is read, that once at Rome it rained
ed Quicksilver, wherewith the Ba
zen Money being rubbed it looked like
silver.

Chalke.

T. Livius.

Titus Livius maketh mention that
rained chalk, whereof the cause cannot
be hid to them that read how stone and
brick come in the Air.

Iron hath also rained out of the clouds, and sundry times, as Histories Iron.
 sheweth, whereof this hath been the true. The general matter of all metals which is quicksilver and brimstone, with the special matter of mixtion that maketh Iron, were all drawn together and there concocted into the metall: came the strange Rain of Iron.

Avicen saith he saw a peice of Iron that fell out of the clouds, that weighed Avicen.
 about an hundred pound weight, whereof very good swords were afterwards made.

Of Dew.

Dew is that Vapour which in Dew.
 Spring and Autumn is drawn up the Sun in the daytime, which be-
 cause it is not carried into the middle
 region of the Air, abiding in the low-
 region, by cold of the night is con-
 densed into water, and falleth down
 in very small drops.

There is common Dew, and sweet
 Dew.

One kinde of sweet Dew is called
 H 2 Man-

Manna.

Manna being white like Sugar, which is made of thick and clammy Vapours which maketh it so to fall thick and white. It falleth only in the higher parts.

As for that Manna which God rained to the *Israelites*, it was altogether miraculous.

Plinius. ⁹
Arabia.Ladanum,
Cusuf.

In *Arabia* (as *Plinius* writeth) is a very precious kinde of Dew that is called *Ladanum*, which falling upon the herb *Cusuf*, and mixed with the juice of that herb which Goats doe eat is gathered off Goats hairs and kept as a treasure.

There is another kinde of sweet Dew that falleth in *England*, called the *Meads*, which is as sweet as honey being of such substance as honey is: it is drawn out of sweet herbs and flowers.

Bitter
dew.

There is also a bitter kinde of Dew that falleth upon herbs, and lieth upon them like branne or meal; namely because it is of an Earthly Exhalation and so remaineth when the moisture is drawn away: This Dew killeth herbs.

The common Dew drunk of Cat-
doth rott them, because the matter
full of viscosity, bringing them to a
xion.

There be Three things that hinder
w from falling; that is, great heat,
at cold, and wind; for Dew fall-
In the most temperate calme

Of Hoare-Frost.

Hoare frost, or white frost, is no-
thing else but dew congealed by Hoare
frost.
much cold. The South and East
and do cause dew, but the North and
northern winds do freeze the Vapors,
so it becommeth hoar frost; which
that excessive cold had not beene,
ould have turned into dew.

The dew and the hoare frost agree in
ree things, namely, in matter, in
ality of time, and place of the gene-
tion. In matter they agree; for they
e both generated of a subtile and thin
apor, and also small in quantity.

In quality of time they consent, for
th are made in a quiet and calm time:

for if there were great wind, it would drive away the matter, and so could there be no generation.

Aristot.

Thirdly, they are both generated in the lowest Region of the Air; for *Aristotle* affirmeth) upon the high hills there is neither dew nor hoar frost.

They differ also in three things. First, the hoare frost is congealed before it is turned into water; so is not the dew.

Secondly, The dew is generated in temperate weather, the white frost in cold weather.

Last of all, hot Winds, as the South and East, do cause dew; but cold winds, as the North and West, do cause hoar frost,

Hoare frost doth often stinke, because of the stinking matter whereof it consisteth, which is drawn out of lakes and other muddy and stinking places.

Of Hayle.

Hayle.

Hayle is a hote Vapor in the middle Region of the Air, by the condensation of that Region made thick into a cloud which falling down to the sudden cold

of Meteors.

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the lowest Region, is congealed
to Ice.

There be so many kinds of Haile, as
there be of raine: The fashion of haile
sometime round, which is a token
that it was generated in the middle regi-
on of the Air, or very near it; for falling
from high, the corners are worn away.
When the Haile stones are square, or
three-cornered, the haile was genera-
ted neerer the earth.

Oftentimes there is heard a great
noise in the Cloud as it were of Thun-
der before haile, or of an Army fight-
ing, &c. The cause is, That Vapors of
contrary qualities, being inclosed in
the Cloud, do strive to break out, and
make a noyse, even as cold water doth,
being put into a seething pot.

In Spring and Harvest-time is often
raile, seldome in Summer and Winter.
In winter there want hot Vapors, in
summer the lowest region is too hot to
congeale the raine falling down. In
Spring and Autumne, there want nei-
ther hot Vapors to resist the cold, nor
efficient cold to harden the drops of
that hot shower of raine.

The fourth Book

The haile stones are sometimes greater, and sometimes lesser: greater, with greater cold; and lesser, with lesser cold.

There is seldom haile in the night, for want of hot vapors to be drawn up.

Sometime haile and rain fall together, when the latter end of the cloud is for want of cold in the lowest region, and the former part is not congealed.

Haile-stones are not so cleare as Snow, because they are made of grosse and earthy vapours, Ice is congealed of clear water.

Haile is sooner resolved into water than Snow, because it is of a more tender and swift generation.

Of Snow.

Snow.

Snow is a cold congealed by great cold, before it be perfectly resolved from vapours into water.

Snow is white, not of the proper colour, but by receiving the light into so many small parts; as in frost, or the white of an egge beaten.

Snow is often upon high hills, & stayeth long there, because their tops are

gre cold, as they be neer to the middle Region of the Air; for oftentimes it raineth in the valley, when it snoweth on the Hills.

Snow melting on the high Hills, and after frozen again, becommeth so hard, that it is a stone, and is called *Christ-fall*.

Original
of Christ-
all.

Other matter of Snow, because they are common with Rain, are needlesse to be spoken of. To be short, sleet is generated even as Snow, but of lesse cold, or else beginneth to melt in the falling.

Snow causeth things growing to be fruitfull, and encrease, because the cold driveth heat unto the roots, and so cherisheth the plants.

Of Springs and Rivers.

THe generation of Springs is in the bowels of the Earth, and therefore something must be said of the body of the earth. The earth, though it be solid and massie, yet hath it many hollow gutters and veines, in which is alwaies aire to avoid emptinesse: for the ignorant in Phylosophie must be admonished,

The fourth Book

Nothing is
empty.

ed, that all things are full, nothing is empty; for nature abhorreth emptinesse; so that where nothing else is, there is Air and Vapors, which by cold, as it hath often been said, will be resolved into drops, as we see experience in marble Pillars and such like hard stones toward raine.

This Air and Vapors therefore being turned into drops of water, these drops sweat out of the earth, and find some issue at the length, where many being gathered together, make great abundance of water, which is called a Fountaine or Spring. The cause why such Springs do run continually, is, because that Air can never want in those veines, which by cold will alwaies be turned into water, so that as fast as the water runneth forth, so fast is aire againe received into the place, whereby it commeth to passe, that so many Springs are perpetuall, and never dried: but if any be dried up, it is in a hot Summer, and such Springs also they be, whose generation is not deep in the earth, and therefore the Vapors may be made dry, and the earth warme so the Spring may fail. There

of Meteors.

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There be foure kinds of springs;
fountaines, brookes, Rivers and lakes.

Of Fountaines.

Fountaines be small springs, which Fonna-
taines.
serve for wels and conduits, when
there is but one place where the Water
is generated; and that is not very a-
bundant, either because it is of small
compasse, or small veines, and not
many.

Of Brookes.

Brookes, boornes or fordes, be small Brookes.
streames of Water, that run in a
channell like a river. They are caused
when either the spring occupieth a
great compasse, or else two or three
small springs meet together in one
channell.

Of Rivers.

Rivers are caused by the meeting Rivers.
together, not only of many springs
but also of many brookes and fords,
which

The fourth Book

which being received in divers places
 as they passe, are at the length caried
 into the broad Sea for the most part.
 Howbeit some Rivers as swallowed up
 into the Earth, which perchance run
 into the Sea, by some secret and un-
 knowne channels: some Rivers there
 be, that hide their heads under the
 Earth, and in another place, far off
 breake out againe. They Write also
 that some Rivers being swallowed up
 of the Earth, in one Island do run under
 the bottome of the Earth and Sea, and
 breake forth in another Island. There
 be also many great Rivers, that run
 under the Earth in great Caves, which
 never breake forth. *Aristotle* sheweth
 of ponds and lakes, that be under the
 Earth. And *Seneca* speaketh of a pond
 that was found by such as digged in the
 Earth, with fishes in it, and they that
 did eat of them, dyed. As *Ecles* that
 be found in darke places, as Wells that
 have beene dammed up, &c. are poyson

Aristot.

Seneca.

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Of Lakes.

Lakes.

LAkes are made by the meeting together of many Rivers, Brooks and Springs into one deep valley: whereof some are so great, that they have the name of the Seas, as the Lake called *Hircane*, or *Caspian Sea*. These Lakes sometimes unlade themselves into the Sea by small Rivers, sometimes by passages under the Earth.

The cause of the swiftnesse of Rivers, is double; for they are swift, either for the great abundance of waters, or else because they run down from an hilly place, as the River *Rhene* falleth down from the top of wonderful high hills.

Of hot Bathes.

SOME waters that are generated and flow out of veines of Brimstone, are sensibly warm, and some very hot, because they run out of hot places. These waters being also drying by nature, are wholesome for many infirmities, specially breaking forth of scabs, &c. Such are

Hot Bathes.

are the Baths in the West Country, and S. Anne of Buck-stones well in the North part of England, and many other elsewhere.

Of the divers tastes that are perceived in Wells.

Tastes of
waters.

FOr a generall reason, the waters receive their taste of that kinde of earth thorow which they run as thorow a strainer. Some salt, that run thorow salt veins of the earth: some sweet, that be well strained, or run thorow such mineralls as be of sweet taste: some bitter, that flow out of such earth as is bitter by adustion or otherwise.

Some sowre or sharpe, like vinegar which run thorow veins of Allome coperas, or such minerals. *Aristotle* writeth of a Well in *Sicilia*, whose water the Inhabitants used for Vineger.

In *Bohemia* neare to the City called *Bilen*, is a Well that the people used to drink of in the morning, in stead of burnt wine.

And in divers places of Germany, be Springs that taste of such sharpeness.

Some

Aristotle.
Well water used
for Vineger.
Bohemia.

Some have the taste of Wine; as in *Paphlagonia* is a Well that maketh men drunk which drink thereof; which is, *Paphlagonia*. because that water receiveth the fumosity of Brimstone and other Minerals thorow which it runneth, and so filleth the brain as wine doth.

Recitall of such Rivers and Springs as have marvellous effects, whereof no naturall cause can be assigned by most men, although some reason in a few may be found.

Litumnus, which maketh Oxen that drink of it white, is a River Spring in *Italy*, *Propert. lib. 3.* This may be the quality of the water, very signemack. In *Boetia* is a River called *Melas*, that maketh sheep black if they drink thereof. *Marvelous waters. Litumnus. Propert. Boetia. Melas.*

Seneca speaketh of a River that maketh red hairs: These two with the rest may have some reason, that the quality of the reason may alter complexion, and so the colour of hairs may be changed, as we see in certain diseases.

In *Libia* is a Spring, that at the Sun rising

Seneca.

rising and setting is warme, at mid-day cold, and at mid-night very hot. This may be, by the same reason that well-water is colder in Summer then it is in Winter. *Seneca* writeth, that there be Rivers whose waters are poyson: this may be naturally the water running thorow poysonous Mineralls, taking much fume of them. Other Wells that make wood and all things else that can be cast into them, stones, such wells be in England, the cause is great cold.

Another Well maketh men mad that drinke thereof. This also may have a good reason, as that which make h m drinke: As also that Well which maketh men forgetfull by obstruction of the brain.

The same *Seneca* speaketh of a Water, that being drunke, provoketh unto lust and lechery. And why may not that quality be in a Water which is mixed with divers Mineralls and kinds of earth, which is in herbs, roots, fruits and liquors?

S. August.

S. Augustine speaketh, of a Well in Egypt, in which burning Torches are quenched, and being before quenched are lighted.

Among the *Garamants* is a Well so *Garamants*
d in the day, that no man can abide
drink of it: in the night so hot,
at none can abide to feel it.

It is incredible that is written of a
ell in *Sicilia*, whereof if Thieves *Sicilia*,
drink, they were made blind.

In *Idumea* was a Well that one quar- *Idumea*.
of a year was troubled and muddy,
the next quarter bloody, the third green
d the fourth clear.

Seneca writeth of another Well that *Seneca*.
s six hours full and running over,
d six hours decreasing and empty:
chance because it ebbed and flowed
th the Sea or some great River that
s neer it.

In the Hill *Anthracinus* is said to be *Anthracinus*
Well, which when it is full, signifi-
a fruitfull Year: when it is scarce
d empty, a barren and dear Year.
e sufficiency of moisture maketh fer-
ty, as the want causeth the contra-

Men say there is a River in *Hungary*, *Hungaria*.
which Iron is turned into Copper:
ich may well be, seeing Inke in
ich is but smal *Coperas*, and artifi-
I cially

cially mixed of Iron, doth counterfeit Copper in colour. In this fire may be much Copperas, and that is naturally mixed.

Seneca.
Theophrastus.

Both *Seneca* and *Theophrastus* witness that waters there be, which within a certain space, being drunk of the (as *Seneca* saith) or of birds (as *Theophrastus* will have it) changeth their colours from black to white, and from white to black.

Vitruvius.
Arcadia.
Nonacrinis.

Vitruvius writeth, that in *Arcadia* a Water called *Nonacrinis*, which in a Vessel of Silver, Brasse, or Iron hold, but it breaketh in peices, and holding but a Mules head will hold it contain it.

Illyria.

In *Illyria*, Garments that are hold over a most cold Well, are kindled and set on fire.

Andros.
Bacchus.

In the Isle of *Andros*, where the Temple of *Bacchus* stood, is a Well, that the fifth day of January flowed wine.

Isidore.

Isidore saith, there is a Well in *Isidore* that healeth the wounds of the eyes.

Chios.

In the Isle of *Chios* is a Well which maketh men dull-witted that drink thereof.

There is another, that causeth men
to abhor lust.

Lechnus, a Spring of *Arcadia*, is good *Lechnus*.
against abortions.

In *Sicilia* are two Springs, of which *Sicilia*.
one maketh a woman fruitful, and the
other barren.

In *Sardinia* be hot Wells, that heale *Sardinia*.
fore eyes.

In an Isle of *Pontus*, the River *Asta* *Pontus.*
overfloweth the fields, in which *Asiars*.
whatsoever sheep be fed, doe alwaies
give black milke.

In *Æthiopia* is a Lake, whose water *Æthiopia*.
like oyle.

Also many Springs of Oyl have bro-
ken forth of the Earth, which comineth
of the viscosity or fatnesse of the same
earth.

The Lake *Clitory* in *Italy*, maketh
men that drink of it, to abhor wine. *Clitory.*

The Lake *Pentafium* (as *Solinus* saith)
deadly to Serpents, and wholesome *Pentafium.*
men. *Solinus.*

Seneca writeth of certain Lakes that
will bear men which cannot swim.

And that in *Syria* is a Lake, in which *Syria*.
icks do swim, and no heavy thing
will sinke. It

Rhene.

It is said, that the River *Rhene* in Germany many will drown bastard Children that be cast in it, but drive a land them that be lawfully begotten.

Hypanis.
Sythia.

The River in *Hypanis* in *Sythia*, every day brings forth little bladders, out of which flies do come that die that same night.

Matrona.

Matrona the River of *Germany*, as the common people saie, never passeth dry but he taketh some prey.

Of the Sea.

The Sea.

THe Sea, in this treatise hath place as a mixed substance: for else the element of Waters being simple, were not here to be spoken of.

The Sea is the naturall place of Waters, into which all Rivers and other Waters are received at the length.

The naturall place of the water.

And here it is to be understood, that the very proper and naturall place of the water, were to cover all the Earth for so be the elements placed: the Earth lowest, and round about the Earth Water, about the Water, the Air, and about the Air, the fire.

Gen. I.

But God the most mighty and wise created

of all things, that the Earth might
some parts be inhabited of men and
beasts, commanded the Waters to be
gathered into one place, that the dry
land might appeare, and called the dry
land Earth, and the gathering of Wa-
ters he called Seas.

In the Sea are these two things to
be considered; the saltnesse, and the
boiling and flowing.

Of the saltnesse of the Sea.

The saltnesse of the Sea, according
to *Aristotles* mind is caused by *Aristot.*
the Sun, that draweth from it all thin
and sweet Vapors to make raine, leaving
the rest as the settling or bottome, which
is salt. But men of our time, per-
venture more truely, doe not take
this for the only and sufficient cause to
make so great a quantity of water salt,
but say, that the Sea, by Gods wisdom;
gathered into such valleyes of the
Earth, as were otherwise barren and
fruitfull; such Earths are salt, the Sea
water then mixed with that Earth,
must needs be Salt; else Rivers by *Ari-*

The fourth Book

Aristotles mind, should be salt as well as the Sea. The Reader may choose which opinion is most probable.

Of the ebbing and flowing.

Ebbing &
flowing.
Aristot.

THe ebbing and flowing of the Sea as *Aristotle* seemeth to teach, is by reason of *Exhalations* that be under the Water, which driveth it to and fro, according to contrary bounds and limits as upward and downeward, wide and narrow, deepe and shallow. This opinion of *Aristotle* also, as more subtil then true, experience teacheth men to mislike, and to ascribe the cause of ebbing and flowing, to the course of the Moone, which runneth over in yf as the Sunne doth over heat: for from the new Moone to the full, all humors do increase; and from the full to the new Moone decrease againe. Also, the very true time of the ebbing and flowing may be known by the course of the Moone, with whom, as the Latines say, we will close up the fourth book of my first and variety of propositions.

The fifth Book.

*of earthly Meteors, or bodies
perfect y mixed.*

THis last Treatise contain- Earthly
bodies,
eth such bodies whose
chiefe matter is the earth,
and are called perfectly
mixed, because they are
easily resolved into the chief matter
whereof they are generated. These are
divided into four Kinds. The first be di-
vers sorts of Earth: The second be Li-
quor concrete: The third be Metalls
and Merallikes: The fourth be Stones.
This division is not altogether per-
fect, both for that there be many of
these Minerals which partake of two
kinds, and also for that the names of
these kinds may be said of others. Yet
standing as plainly as can be, to declare
these things themselves; the controver-
sie and cavillation of names, shall not
greatly trouble us, especially seeing
we pretend not to teach Philosophers,
but such as need a ruder and plainer in-
struction.

struction. They may therefore be content with this division, which shall serve them to dispute of these matters but to understand the truth of the things that they desire. Of these four therefore we will speak orderly and generally, not minding to treat of every particular kind (for that were infinite) but to open such universall causes, they which have wit may learn (if they list) to apply unto all particulars.

Of Earths.

Of Earths

THe Earth is an element, one of the four, cold and dry, most gross and solid, most heavy and weighty, the lowest of all other in place. When I say Element, I meane a simple body uncompounded. This Earth is not Meteors but as it was shewed in the water, the end there should be generation of things. There is no Element that have which is pure and simple, but they are mixed and compounded. Our fire is grosse and compounded; so is our air, our water, and our earth: but the earth notably and above the rest, is mixed

For the pure and naturall Earth is dry
and cold; but we see much to be moist,
and much to be hot. The natural earth
is black of colour: but we see many
Earths white, many yellow, and many
red. So that first, the greatest part of
the Earth is mixed with water, that
maketh it to cleave together, with aire
and some fire, which make an oylie, fat
or clammy earth, as is clay made, &c.

Another great part is dried, not in-
to the naturall driness of the first qua-
lity, but as a thing once mixed, and af-
ter dried, either by cold, as sand,
gravell, &c. or else by heat, as chalke,
coaker, &c. And yet somewhat more
plainly and particularly to discourse
upon these causes, admitting the natural
colour of the Earth to be black, of the
water to be blue, of the aire to be
white, and of the fire to be ruddy, it
followeth, that upon the mixtion of
these colours, or chiefe domination of
them, all things have their colour.

The grosse substance of the Earth
therefore being diversly mixed with o-
ther Elements, and those mixtures a-
gain being chisones altered by divers
and

and sometime contrary qualities, hath brought forth so many kinds of earth, as clay, marble, chalke, sand, gravell, &c. Clay is mixed with that moystrure, taking his Colour of the mixture with red from white; but being cold, it is not so fruitful as Marble, which is not alwaies so moist as it. Chalke is an Earth by heat concocted, after divers mixtions, and dried up. Oker, both yellow and red, with such like, are of the same nature, with mixtion of red, more or lesse.

Sand and gravell, are dried Earths, as it were frozen by cold: gravell is grosse and apparent; sand, though it be finer, is of the same generation, consisting of many small bodie, which are congealed into stones. Sand seemeth to be clay dried by cold, and clotted together into small stones; whereof some are thorow-thining, which were the moist parts; the thick were of the grosse part: the same is gravell, but of greater stones consisting. The like judgment is to be given of all other kinds of Earth, whose generation by the similitude of these will not be very hard

to

to find out. They that list to know the
 divers kindes of Earths, must have re-
 course to *Plinius*, *Cardanus*, and other *Plinius*.
 Writers, that recite a great number of *Cardanus*,
 them : but these are the chiefe and most
 common kindes.

Of Liquors concrete.

WE take not liquors concrete so
 largely as the word doth signifie,
 for then should we comprehend both
 the other kinds following. But only
 those liquors, called in Latine *Succi*,
 which are as it were middle betweene
 metalls and stone, of which, some being
 fat and oily, doe burne as Brimstone,
 Sea-coles, Jet, *bitumen*, &c. and the
 kinds of all these. Other some do not
 burne, as Salt, Allum. Copperas Salt-
 peeter, &c. and the kinds of these.

Of the first sort, which are generated
 of Earthy and Airy Vapors, Fumes
 and *Exhalations*, the chief and most no-
 table is Brimstone, which seemeth to
 be the matter of all dry and hot qua-
 nities that are in Earthly *Meteors*.
 The rest are generated of such like
 Vapors

Vapors as Brimstone is, but then they be diversly mixed: as the coles have much Earth mixed with Brimstone. Jet seemeth to be all one but better concocted then coles. Of Amber is great contention, whether it be a mineral or the sperme of a Whale: for it is found in the Sea, cast upon the shore. Now the Whales feed being of the very same qualities, is taken more and less concrete of divers hardness; some almost as hard as Amber: some softer and some liquid: yet *Cardan* plainly defineth, that Amber is a Mineral. Whether he have reason or experience, contrary to the vulgar opinion, let them consider that list to contend. These Minerals that will resolve with fire, it is apparent, that they were concrete with cold: in that they burnt, it is manifest, they have a fat and clammy substance mixed with them, as the other kind hath not, which will not resolve so well with fire as with Water; which be salt, copperas, saltpeeters, &c. These burne not, being watery, Earthy, and not fat, unctuous, nor clammy.

These be of divers colours, black, a

Colo

Coles, and Jett, because there is much
 Earthy substance mixed with their
 sulphurous matter. Some be sheere, as
 Salt, and Allome, having a substance
 Watery dryed, and concrete. Copperas
 is Greene, because it hath much cold
 matter that is blue, mixed with it.
 Salt, the most common and necessary
 of all these liquors concrete, that be
 moist and not fatty, hath two manner
 of generations; one natural, and the
 other artificial. The natural genera-
 tion is when it is first generated in
 the Earth; after commeth the water of
 the Sea, and is infected with it; out of
 which the Salt is againe artificially
 gathered. Of these liquors concrete, be
 those strangewells and springs infected,
 of which was spoken in the latter end
 of the fourth book. Most notably
 Brimstone causeth the hot Bathes, and
 burneth in *Ætna* of *Sicilia*, and *Vesuvius* of *Italy*, casting up the Pumice
 stones, of which is no place here to
 treat.

of

*Of Metals.***Metals**

Metals be substances perfectly mixed, that will melt with heat and be brought into all manner of fashion that a man will.

Mercury.

Of these the Alchymists say there are Seven kinds to answer to the Seven Planets; Gold, Silver, Copper, Tinne, Lead, Iron, and Quick-silver they call Mercury. But saving the Authority, Quick-silver is no more Metal then Brimstone, which is as necessary to the generation of Metal as Quick-silver is. For they all agree that all Metals are generated of Sulphur, that is Brimstone, which because it is hot they call the father; and Mercury, that is Quick-silver, which because it is moist, they call the mother; so by as good reason may they call Brimstone a Metall as Mercury.

Then there remaineth but Six perfect Metals; Gold, Silver, Copper, Tinne, Lead and Iron.

Of Gold.

THat most unprofitable and hurt- Gold.
full of all Metals, Gold which
most men dispraise, and yet all men
would have, is of all other Metals the
rarest: it is only perfect, the rest are
corruptible.

Gold never corrupteth by rust, be-
cause it is pure from poysonous infecti-
on, and most solid, that it receiveth
not the Air into it which causeth all
things to corrupt. It is perfectly con-
cocted with sufficient heat and mixture
of Sulphur: all other Metals either
are not so well concocted, or else they
have not the due quantity of Brim-
stone.

Why Gold
rusteth
not.

This opinion hath also place among
the Alchymists, that because Nature in
all her Works seeketh the best End, she
intendeth of all Metals to make Gold;
but being lett, either for want of good
mixture, or good concoction, she brin-
geth forth other Metals, indeed not so
precious, but much more profitable;
and the less precious, the more profi-
table:

The opini-
on of the
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table: for there is more use to the necessities of mans life in Iron and Lead then in Gold and Silver; but either the beauty or the perfection, or at least the rareness of Gold and Silver have obtained the estimation of all men, so that for them is sold all manner of things, holy and profane, bodily and spiritual.

What paines do not men take to win Gold? Every man hath one way or other to hunt after it: but the Alchemist despising all other ways as slow, unnatural and unprofitable, laboureth either to help Nature in her work, as of imperfect Metals to make perfect, or else to force Nature to his purpose by his Quintessences and Elixars, so that what by purging, what by concocting, what by mixing of Sulphur and Quicksilver and much other like stuff, at length he turneth the wrong side of his gown outward, all the teeth out of his head, and his body from health to Palsey, and then he is a Philosopher and so he will be called.

Of Silver.

Silver the most pure Metal next unto Gold, hath indifferent good condition in the Earth, but it wanteth sufficient heat in the mixture that maketh it pale. Silver.

It is found (as they say) running in divers veins, as all other Metals be, but this most specially, after the shape and fashion of a tree lying along with body or stock, of proportion like to the body of a tree, also with armes, branches, leaves and fruits.

This Metal Silver lacketh sufficient heat, and therefore cometh neither to colour, solidity nor perfection of Gold, and is generated in cold countries, neer unto the North and South poles, in so great quantity, that the husbandmen when they plow their ground, turn up silver among the clods in their daily labours, which they do hide and conceal, lest the greedy desires for Covetousness of the Metals, should overturn and destroy their land.

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The

The fifth Book

The Gold Mines are contrariwise most found in the hot Countreies of *India* and *Aethiopia*, because in them sufficient of heat for that unhappy generation.

This Silver also the Alchymists would faine make by Art; but Mercury the chief Master of the Work, is subtiler and so fly, that nothing can hold him, nothing can kill him: if the glass be not very thick, he will soon break out of prison, and so there is nothing left.

Of Copper.

Copper in colour comming neerer to Gold, being not so solid nor so massy (for of all Metal Gold is the heaviest) giveth way to Corruption being infected with that green Minerall Copperas.

Hereof be divers kindes, Brass, Pewter and such like, which differ in digestion; the Copper being purest, is the best digestion and neereſt unto Gold and so the rest in like degrees.

Copper is most like Silver in

weight and in the hammering : wherefore the Alchymists have learned to make it white, that it deceiveth mens sight and handling : but the Goldsmiths do easily try it, and by the taste of counterfeit Silver make Copper again.

Copper or Brass doth always grow dear to the Mine of Copperas, which running with it in the digestion or natural concoction, hindereth it of perfection, maketh it to stink, and to be eaten of a green rust.

Much ado the Alchymists have to turn it into Gold, if it might be : they dispute very reasonably and conclude almost necessarily in their Talk, that it may be converted into Gold as a body that wanteth a little of perfection, which may be easily added unto it : but in conclusion of the work, it is an harder matter to bring to pass, then it was to purpose, before they had done it, to build an Abbey at every Miles end upon Salisbury Plain, as one was minded.

of

Of Tinne.

Tinne.

Tinne whereof great plenty groweth in the West parts of *England* in beauty and colour commeth neerer to Silver, and of Silver wanteth nothing but solidity and hardness: for Tinne is raw and undigested metall, and so very porose and compact, which causeth it to crash when it is broken or bitten: so it faileth of heat in the commixtion, and also sufficient digestion in the Earth: otherwise it is a fair and profitable metall, to serve the use of them unto whom Silver and Gold are not so plentiful.

Of Lead.

Lead.

Lead also found in great abundance within this Realm, is a raw and undigested metall as Tinne is, but yet of better digestion then commixtion: for it is mixed with a gross earthy substance, which maketh it to be in colour so black and so fowle to corrupt: so that of the same Fumes and

Exhausted
the w
nothi

Exhalations (which if they had been pure and well digested, if the place and matter would have suffered should have been concrete into Silver) for lack of the same, Lead is generated, which coming plentifully, doth better service then Silver.

Of Iron.

Iron the most necessary and profitable of all other metals (and yet ^{Iron.} still used of many as any other) is generated of such substance as Silver is, but mixed with a red Mineral which eateth it with red rust, and also being of too extreame digestion, passing all other metals in hardness. And as other metals to the perfection of Silver want sufficient concoction, whereby they come not to the same hardness: so Iron passeth and exceedeth Silver in immoderate digestion. But though it come not to the perfection of Silver, God forbid that all Iron had been turned into Silver: for then we should more have missed it then silver or gold, the want of which would hinder us nothing at all.

*Of Quick-silver.*Quick-
silver.

THough Quik-silver be no metal, yet because it is the mother of all metals, something is here to be spoken of it.

There be divers and sundry opinions, both of the generation and also the qualities of it, which make the generation hard to find out. For if the quality were certainly agreed upon, there were an easier way found to try out the generation.

Some affirm that it is exceeding hot, and that they would prove by the swift peircing thereof into other things that be porose.

Others say it is exceeding cold, and that they prove by the exceeding weight of it. As for the peircing, they say it is caused of the exceeding moistneis, of which quality both parts do grant that it is. Concerning the generation, some have said that it is pure and Elemental water: some again have thought that it droppeth out of heaven, and is a part of the heavenly sub-

ance. And others say that it is generated in the Clouds, and falleth down in the fields in a Circle, on those round Circles which are seen in many fields, that ignorant People affirm to be the rings of the Fairies dances.

It is certain that Quick-silver hath divers times fallen out of the Clouds, as we have declared in the Treatise of Wonderfull and Marvellous Raine: whether it so fall in circles it is doubtfull. The most probable opinion is, that it is generated of moist Vapors of the Earth, coacted by cold, much like to Water, as Brimstone is of hot flames, coacted by cold, much like to Sulphure. And thus much of metals.

Of Stones.

Of Stones, the fourth kind of Earthly Stones. Mixed bodies have two manner of generations, by most contrary qualities: for heat doth harden moist bodies into stones; and we see that, clay, it maketh exceeding hard brick.

Also the Thunderbolts in the clouds

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are

are generated by heat, as before hath been shewed. But cold doth by congeling, generate many more stones then heat doth; for the most part of all the stones that are digged out of the Earth, are generated by cold, which is able to convert any other kind of mixed substance into stone, as hath been partly shewed in the nature of wells and springs, of which, there be some in *England*, which by their cold turne wood, or any like thing into stones. I have seene a peece of rotten wood, which to sight was very light and like wood, but in handling, a very stone that was taken out of such a Well. Also of other things taken out of the Earth, turned into stones, I have seene and found my selfe, flies; with heads and wings, very hard stones; also, I have seene a heart, a birds tongue, a beasts stone, a peare, a plumme, and divers other things turned into hard stones.

Of divers kinds of stones.

STones may first be divided into
 rude and beautifull: the rude con-
 taine those great Rocks, which are Rocks
 generated by many small parts ioyned
 together, and the common pibble stones Pibble
stones.
 that be found every where in the Earth,
 among gravell, and on the shore of
 the Sea, or bancks of the Rivers. These
 are generated of grosse and Earthly
 humours, congealed by cold: and
 because they be neither faire of colour,
 nor thorow shining, and also common,
 they are contemptible. The faire or
 beautifull stones, be either great or
 small. The great be as marble of divers
 kinds and colours, alabaster, and such Marble.
 like, which being hard and well con-
 cocted, may be polished and become
 beautifull. Their colour is as they are
 mixed, being uncongealed, so is their
 purenesse. The small are more precious,
 and they be either thick or pellucide.
 The thick be neither so faire nor so
 precious, as the *Achates*, the *Jasper*, Achates.
Jasper.
Prassios, &c. These consisting of a pure Prassios.
 mat-

Diamond.
Saphir.
Emerald.
The price
of precious
Stones.

matter, and not very watery, are congealed into such stones. The clear stones be liquors concrete, as the *Diamond*, the *Saphir*, the *Emerald*, &c. they are praised for their greatnesse, hardnesse, clearenesse, and faire colours, of which enough hath bin spoken, saving that some be of opinion, that these be generated by heat, because the best are found in hot countries, in the East, and in the South. Answer may be made, that the hotter the Air is, the colder is the Earth: so that reason is of small force.

Of the vertue of Stones.

The vertue
of
Stones.

SOME perchance, would looke that we should make a long discourse of the vertue of stones, and would be well content that we should treat of divers properties of gemmes and precious stones, which matter though it be out of our purpose (which considereth only the generation) yet seeing it is not out of their expectation, some thing briefly, and yet sufficiently shall be said of the vertue of stones.

That vertue that is ascribed unto them,

em, is either Natural or Magical. Na-
rall vertue, is either that which is
nown to have a natural cause, or a na-
ral effect, as the *Magnes* or Load-
one to draw Iron, which is by a simi-
de of nature, & such an appetite as is
etween the Male and the Female. Al-
the said *Magnes* moveth toward the
orth, and as some say, there is ano-
er kind found in the South, that draw-
th toward the South. They say, that
ere are great hills of this stone in the
orth and South, which maketh it look
at way.

Others bring a Mathematicall rea-
on, which because it is more curious
hen can be understood of the common
ort, not exercised in Geometry, I o-
mit.

The Jet and Amber draw hairs, chaffe,
and like light matter, but being before
chafed, for heat is attractive.

Also the precious Stone called *Astroites*,
moveth it self in Vinegar, the sharp-
nesse of the Vinegar peircing it, and the
aire excluded driving it forward.

These vertues because I have seen, I
have set for an example; generally all
other

The vertue
of Stones,
either na-
turall or
magically
Magnes.

Jet and
Amber
draweth
chaffe.
Astroites, a
Stone mo-
veth in vi-
negar.

other like naturall vertues, proceed of like naturall causes, which by their effect, the ingenious must seek to find out.

As for Magical Vertues, they be they which are grounded on no reason, or natural cause; which if they take effect it is rather of the superstition and credulity of him that useth them, then of the vertue of the stones. As that an Emerald encreaseth love, a Saphir favour, a Diamond strength, and such like vertues, of which *Albertus* in his Age, furnamed the Great, took paines to write a Book, which I suppose to be Englished.

*Albertus
Magnus.*

To conclude with the cause why Stones melt not, as Metalls do, may be gathered by that which hath been said before, because they are congealed past that degree, and also because there is left in them no unctuous or clammy matter. Let this suffice for Stones; and so the whole purpose is at an end.

Ob

OBSERVATIONS

On *Dr. F.* his
BOOKE OF
Meteors.

By *F. W.*



LONDON,

Printed for *William Leake* at
the Crown in Fleet-street.



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CHAP. I.

Of the Earth.

IT is a great Question amongst Philosophers, Whether the External and Visible Riches and Plenty which groweth and springeth on the face of the Earth : or the Internal and Hidden Treasure be more precious and valuable ?

Flowers and Fruits, Corn and Cattel, and all other external terrestrial Births are of most rare and exquisite use for mankind : but the Earth is an Element not only beautified without, but most richly stored within with great Varieties of admirable Creatures, both pleasant, rare and profitable for humane Content and Conservation.

From

* Ils l'appelloient
la mere
grand &
la mere de
dieux.

Antoine
du verdier
En la Rel-
ligions de
Pagens.

Cps.

From this very Consideration the Philosophers of Old reckoned and esteemed the Earth as the first and most ancient of all the Gods, and so stiled her * The Grandmother or Mother of all the Gods. And the Heathens did not only honor the Earth as a Mother, but did adore her as a Goddess, giving her the names of *Ops*, *Cibele*, *Rhea*, *Proserpina*, *Vesta*, *Ceres*, and other Appellations to signify the diversities and several effects and vertues which she produced.

The Earth was called *Ops*, which signifyeth *Aid*, because she affordeth aid and comfort to all Creatures inhabitant on her: And *Pausanias* reports that near the River *Crasside* in *Greece*, there stood a little Temple dedicated to the Earth, wherein she was adored *Dea largi pectoris* as the Goddess of the open and large brest, freely feeding all her Children which in numerous companies were ranged by her.

Her Robe was rich and glorious, embrodered with the most pleasant flowers of all colours: and she was adorned with a Mantle of Tissue whose ground

ground was a beautifull Green, signifying her great Plenty of all things wherewith Man-kind might be affected, as most valuable and precious; and such are her rich Mines of Gold, Silver, Copper, Brasse, and Iron: or yet more highly priz'd Commodities, as precious Stones, and rare rich Gems of all kinds.

CHAP. 2.

Of Metalls.

THe visible beauty of the Earth is obvious to every eye, which is not the subject here in hand: Her abstruse and hidden riches, *Preciosa periculata*, as *Boetius* calls them; her precious Metalls and Mines, which force men to be so bold and ingenious, are the matter of this Discourse: These *Aristotle* calls *Corpora perfectè mixta*, inanimate bodies of compleat mixture, made up of Sulphur and Quick-silver, the veines of the Earth being composed of a fit temper for such production: Some Philoſophers make the Ery-

L

mon

mon of *Metallum*, from *mutans* which signifies a change effected in the Subterranean Veines with long labour and much difficulty.

Some Naturalists are more short, and seem more plain; affirming, That *Metalls* is that which is plyable by the hammer, and hard: Stones are hard but not plyable, and Wax and Mud are plyable, but not hard.

CHAP. 3.

Of the number of Metalls.

Metalls are seven in number, as the Planets are; Gold, Silver, Amber, Iron, Lead, Brasse, Copper. Gold presenteth the Sun, Silver the Moon, Amber called *Electrum* Mercury, Iron Mars, Lead Saturn, Brasse Venus, and Copper Jupiter; or else the seven may be distinguished thus: All Metall is perfect, soft and pure as Gold; or it is pure and hard as Silver; or it is hard and impure as Iron; or it is soft and impure as Lead: And for Amber, it is compounded of Gold and Silver, as Cyprus

Cyprus Copper is made of Brasse and Iron, containing an equall substance of Brasse and Iron, which causeth that so much concocted, and high tinted easily changed into Brass, and re-
changed againe into Copper.

CHAP, 4.

Of Gold.

Gold is *Metallum purissimum*, the purest Metall of all others; and Nature never took delight to make a more perfect elementary substance then Gold is; and therefore in price and estimation, is far above all other riches. The Composition of Gold is proportioned in equall quality, fitly Correspondent in the Symmetry of the elements which compound it; it is even in the Originals so purified already, as are the simple & pure Elements, in such sort, that by their conjunction together in equall power, there is engendred so delicate and perfect a mixture of indissoluble union, composing an accord so faithfully, that there is made there-

by an incorruptible Paff, which is permanent to all eternity, in the excellency and goodneffe thereof; wherefore Gold cannot be vanquished by injury of time and antiquity; neither can it contain in it selfe, nor support any increase and superfluity of Rust; for though it be put into the water or fire, and there remain a long space; yet it is never stained, nor accepteth it any other quality but what is Naturall. No, yet doth Gold fail any whit, which is a sole priviledge belonging to this royal all Metall, all other being subject to alteration and corruption; for though Gold be drawn into the smallest wire, and be extenuated as fine as the thread in the Spiders web; and though it be buried in the most piercing medicines as are Sublimatum, Verdegreas, Salt, Venegar, and that it remain three thousand years therein, it will not for all that be corrupted, but rather the more refined, provided the Gold be perfect, and not sophisticated and false.

CHAP. 5.

Where Gold is found.

Gold is found in divers manners, to wit, mixt with Sand as in *Bombay*: on the shore-side amongst the stones near to *Goldborough* & *Risegrand*; and amongst the stones in mountaines, as in *Calecut*, and in the Indies:

The Generation of Gold is usually in the tops of Mountaines, because there in the highest places the Sun doth more easily purifie that which retaineth too much earthiness in it: and when the Raine and Torrents do flow downe, they carry the Gold downe with them to the foot thereof, where it is gathered amongst the sand, or in waters neer thereunto, whether it is driven by the violence of floods, or except the Ground perhaps open with those inundations, and the Gold fall into the gaping jaws of the Earth, and stick there. Now it is observable, that that which is found in the entrance of the Mine, is not the purest, but

As an earnest to invite to farther la-

bour and pains. That which is found in Waters and Rivers is fished for, and in form of little Grains : In Rocks and Mountains it is taken out by delving and digging. And there be three sorts of Mines, some are called Pendent, some Jacent, and some Oblique and turning. Pendent are those which are found on the superficies and tops of Mountains. Jacent are low, and lie in plain fields. Oblique have a cross Course, whether it be to that which is Pendent, or Jacent, all whereof is driven by Rivers into the next floods.

CHAP. 6.

Of Silver.

THe most noble amongst Metals next to Gold; is Silver; for though Copper in colour, and Lead in weight do nearest approach unto Gold; yet Tenuity of substance, in pureness and fastness, Silver is so like unto it, that good silver may be rightly said to imperfect Gold in substance; failing in colour, and that by succession of time it is sometimes changed into Gold,

many years space Lead turneth into silver. The Mines of Silver are more ordinary then Mines of Gold; and it is usually engendred in four manners, to wit, either in the Earth, or in Brasse, or in Lead, or in Stones, which being forged and melted, yeeld some quantity of Silver. In the Mountain called *mons Reginus*, stones retain very much silver, which being put in the fire, there is found in every pound of silver that is smelted out of them, half an ounce of Gold at least.

Silver is many times found to be mixed with Copper, as in *Alsaria*, near to the *Rhine* in the Mountains of *S. Anne*, and in *Messein*. When Silver is separated from Lead, it leaveth a scum which is called *Lithargyrium*, which is a kind of impure Lead.

CHAP. 7.

Of Quick-silver.

Quick-silver is called *Materia Metallaris*, the matter of the Metalls; and though it have the name of Silver, yet in nature it approacheth nearer to

Gold ; for it is like unto it in Tenuity and weight, and to Silver onely in colour. And notwithstanding the opinions of many *Chymists*, Quick-silver is not a Metall, but a Water condensate not by heat (for it is not hardned) nor by cold (for then it would be a stone or metall) but by some other terrestrial all rare and pure portion, whereby commeth to be weighty and colour splendent and liquide, and is therefore ranked amongst those metalline substances which differ but little from water; and it is common in experience that the Mountains wherein Quick-silver is found, are very green and full of fountains.

CHAP. 8.

Of Electrum or Amber.

MAny Authors, Philosophers, and *Chymists*, disagree in their opinions and discourse of Amber; some reckon Amber amongst plyable and hard metalline substances; others will not acknowledge it but to be but the gum of a Tree producing Rosin which is common in *Arabia*.

Phile

Philemon writeth, that in two places
of *Scythia*, Amber is digged out of the
ground like a kind of stone, and in one
place it is white, and in another it is
yellow; to omit this Argument, and to
agree with those who allow Amber to
be a Metall, is most consonant to rea-
son: The nature and property of it
is a mean betwixt Gold and Silver, and
such is the true and naturall Amber:
as for that which is used for Beads, it is
but artificiall.

Amber partaketh more of Gold then
Silver, because it is more pure, & more
apt to be wrought; for if it consist more
of Silver, it could not endure the forge
and hammer.

Vessels are made of Amber, some for
beautie, some for profit: and if com-
posed of true and good Amber, they
will discover poysons by cracking, and
making signs of an Arch within: for
when the rare humidity thereof com-
meth to be consumed by the force of
venome, it cracketh, and the colour
changing in the Vessel, it seemeth in
stead of the great splendor thereof,
there doth a kind of stain represent it
self

Observations.

selfe like unto an Arch. Now that this Metall is more rare, is ignorance that knoweth not the vertue; or avarice that greedily thirsteth after Gold and gaine.

CHAP. 9.

Of Iron.

IRon is taken out of the Earth, and to make it Malleable, the mass thereof is laid to drie in the Sun; and that which is Earthy, doth soften and moulder with the Raine, as that which is moist doth melt with the Sun; which as the venome of it is consumed in the Furnace by the fire, by how much more it is purged in the fire, by so much the more it is pure in its goodnesse, in such sort as that which is earthy, doth at last turn to schales and dross, and the most subtil part thereof doth convert into Steel.

CHAP. 10.

Of Steel.

THe common Steel is artificiall extracted Iron, Iron more excellently

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lently purged, and a little Marble added thereunto; but in many places there is Naturall Steel, namely in *Per-*
sa very good, and in the *Chaldean* Isle, and neer *Damascus*, whereof the best Cemeters and Faulchions in the world are made, which cut so well, that there is no Razor, be it never so well steeled and tempered, that hath a more keene and sharper edge; for this cause some say, That there are some kinds of Steel and Iron so excellent, that weight for weight, they are esteemed of greater price then Gold.

C H A P. I I.

Of Lead.

LEAD is a gross dull Metall, Pro-
created and Consistent of more im-
pure Quicksilver, and more feculent
and crass Sulphur; it least indures the
fire of any Metall, and therefore soonest
melteth. *Galen* saith, Lead buried
long in moist subterranean Caves and
holes, increaseth in magnitude and
weight, and therefore is a Cover (if wel
considered) lesse proper for any buil-
dings;

dings, but where the Roots are of infinite strength; There be divers kinds of Lead, some red, some white, some black, and a fourth sort of a mean quality betwixt white and black, found in the mountaines of *Bohemia*. The Ore of Lead is melted in furnaces, and is let runne through pipes out of the furnace, whether the Workmen will. Lead is an incongruent and malignant Metal to all others; and if but one ounce be mixed and incorporated with one hundred ounces of Silver or Gold, the mixture will render the whole mass brittle and fragill; and so it will be in all like proportions.

C H A P. 12.

Of Tinne.

TIn is a white Metal somewhat like to Silver for its splendor & whiteness, and yet not much above Lead for its softnesse and porosity. And this is the difference betwixt Tinne and white Lead, that the one is ingendered where there is some Silver mine or veine, but the

the other is generated apart without
the company of so rich a Neighbour.

CHAP. 13.

Of Brasse.

BRASSE is a more impure Metal: which
is composed of much sulphurous mat-
ter, is more hot, light, and less pory,
and so less subject to corruption
and rust by reason of all moisture and
humidity (almost) consumed in it.

In times past, it was very usuall to
make Shields and Bucklers, and Pikes,
& Launces therof, as *Homer* reports how
Menelaus pursued *Paris* with a brazen
Lance. This Metal is proper for Trum-
pets, because it maketh a great noise in
Dorick musick, and inflameth men to
Combat: That of Cyprus is harder, and
therefore better than any other.


CHAP. 14.

Of Copper.

COPPER, or Orichalcum, is Latten, or
as some call it *as factisium*, artifi-
ciall brasse; it represents with it a golden
Com-

Complexion, but is somewhat more yellow then Gold; some because of Copper, make two kinds of Brasse, the one Natural, the other Artificial; the best hath spots of shining Gold intermingled; and the Merchants tell us, that in *Nova Hispania* in *America*, a peice of it hath bin found of two hundred pound weight. The Artificial brasse, commonly called Copper or Latten, is very ordinary; and the most excellent is that which in foure pounds of brasse, doth containe in it one pound of white Lead. Also when the white Lead is mixed to the eight part of brasse, then is the Copper very good; but it is base when mixed with black Lead: the use of Copper is chiefly for faire instruments, as Ordinance, Cauldrons, and such like, wherein it is more excellent then brasse; and it giveth no ill taste or smell to meat boyled in it.

FINIS.



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